-ISRC #380
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People and the Sound

OUTDOOR RECREATION

A Planning Report prepared for the New England River
Basins Commission by the U.S. Department of the Interior,
Bureau of Outdoor Recreation

New England River Basins Commission

The Long Island Sound Regional Study is a "level B water and related land resources study." It was conducted under provisions of the federal Water Resources Planning Act of 1965. The Plan which has been developed was prepared by a team of federal, state, and regional officials, local citizens, and the scientific community, under the overall coordination of the New England River Basins Commission. It is a part of the Commission's comprehensive, coordinated joint plan for the water and related land resources of its region, which includes New England and the New York portions of Long Island Sound.

The plan for Long Island Sound recommends a program for action by federal, state, and local governments; it does not bind them to undertake specific recommended actions. To assist in the evaluation and implementation process, the following reports have been prepared:

A PLAN FOR LONG ISLAND SOUND: A SUMMARY. Highlights of the plan and a brief discussion of the rationale leading to recommendations.

A PLAN FOR LONG ISLAND SOUND: SUPPLEMENT. A more comprehensive planning document which enumerates the major alternatives considered in formulating the recommendations, together with an explanation of how the plan was prepared, who did the work, and background information organized both by subject matter and by geographical sub-regions of the Study Area.

PLANNING REPORTS. Each planning report was developed by a "Work Group," chaired by a federal agency, with the active participation of state and local agencies, other federal agencies and citizen and scientific advisors. These reports incorporate data (originally published in a series of Interim Reports) which estimate people's demands for the resources of the Sound region, the requirements needed to meet those demands, the existing capacity of the region to meet the requirements, and any deficiencies noted.

The second half of each planning report develops solutions by stating objectives in terms of satisfying defined needs, suggesting alternative ways to achieve the objective, evaluating each alternative in terms of environmental, economic, and social criteria, developing economic, environmental, and composite plans, and finally making recommendations.

The following Planning Reports were prepared:

Water Management by the U. S. Environmental Protection Agency, and the States of New York and Connecticut.

Land Use by Ralph M. Field and Associates for the U. S. Department of Housing and Urban Development.

Outdoor Recreation by the U. S. Department of the Interior, Bureau of Outdoor Recreation.

Fish and Wildlife by the U. S. Department of the Interior, Fish and Wildlife Service; and the U. S. Department of Commerce, National Marine Fisheries Service.

Shoreline Appearance and Design by the U. S. Department of the Interior, National Park Service and Roy Mann and Associates.

Marine Transportation by the U. S. Department of the Army, Corps of Engineers.

Power and the Environment by Federal Power Commission staff.

Mineral Resources and Mining by the U. S. Department of the Interior, Bureau of Mines.

Flood Damage Reduction by the U. S. Department of the Army, Corps of Engineers; and the U. S. Department of Agriculture, Soil Conservation Service.

Erosion and Sedimentation by the U. S. Department of the Army, Corps of Engineers; and the U. S. Department of Agriculture, Soil Conservation Service.

OTHER REPORTS published in conjunction with the Study are:

An Economic Perspective by the U. S. Department of Agriculture, Economic Research Service; and the U. S. Department of Commerce, Bureau of Economic Analysis. An examination of the economic and demographic trends in the region, with data for use as the basis of all projections made in the Study.

Shoreline Appearance and Design: A Planning Handbook by Roy Mann Associates, Inc., for the U. S. Department of the Interior, National Park Service. Recommended management procedures for protecting and enhancing the region's scenic resources.

Sources and Movement of Water by the U. S. Geological Survey, Water Resources Division; and the National Oceanic and Atmospheric Administration. A summary of the hydrology and climate of the region.

Soils by the U. S. Department of Agriculture, Soil Conservation Service. An inventory and analysis of soil composition in the region.

For a complete listing of reports published by or in conjunction with the Study, see Appendix A of the Supplement. Copies of these reports are available from:

New England River Basins Commission
55 Court Street
Boston, Mass. 02108

National Technical Information Service
Springfield, Va. 22151

OUTDOOR RECREATION

A Planning Report

Long Island Sound Regional Study
New England River Basins Commission
270 Orange Street
New Haven, Connecticut 06511

Prepared by the
U.S. Department of Interior
Bureau of Outdoor Recreation
Northeast Regional Office
January 1975

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FOREWORD

Long Island Sound is one of the nation's unique and irreplaceable natural resources. An almost fully enclosed arm of the ocean, it has over 1300 square miles of water surface and over 600 miles of coastline. Spreading eastward along both shores from the great metropolitan center which lies at the Sound's western end, a growing concentration of increasingly affluent people make ever greater demands on this urban sea. At the same time, there is a growing feeling that the conflicting demands are destroying the Sound, and that the problems must be resolved if the Sound is to be preserved.

The Long Island Sound Regional Study is a comprehensive planning effort by the Federal government and New York and Connecticut, led by the New England River Basins Commission. Assisting the Commission are professionals from many disciplines representing the Federal, state,and regional agencies listed on the back cover, a Citizen Advisory Committee, and a Research/Planning Advisory Committee composed of members of the region's scientific community.

> THE GOAL OF THE STUDY IS TO PRODUCE A PLAN OF ACTION BY THE SPRING OF 1975 WHICH BALANCES THE NEEDS TO PROTECT, CONSERVE AND WISELY DEVELOP THE SOUND AND ITS RELATED SHORELANDS AS A MAJOR ECONOMIC AND LIFE-ENRICHING RESOURCE FOR THE 12 MILLION PEOPLE WHO LIVE NEAR IT.

This planning report is one of a series. The first half of each report is problem-oriented. It summarizes demands placed upon the Sound and adjacent lands, their capacity to supply these demands, and present or expected needs to be met, if it is determined that supply should meet demand. The last half of each report is solution-oriented. It formulates tentative objectives and alternative measures for achieving the objectives. It evaluates the environmental, economic and social implications of each measure and formulates alternative plans. One plan is tentatively recommended. The planning reports are printed and distributed before the final version of the main report. Therefore, final recommendations are to be found only in the main report, scheduled for publication in the Spring of 1975. Planning reports in this series include:

- Land Use
- Water Management
- Shoreline Appearance & Design
- Erosion and Sedimentation
- Flood Damage Reduction
- Recreation
- Fish and Wildlife
- Marine Transportation
- Minerals
- Power and the Environment

SUMMARY

PURPOSE OF THIS REPORT. To assemble information on projected demand for and existing supply of recreation resources, and to recommend how the projected need can be met in environmentally, economically, and socially acceptable ways. For simplicity and emphasis, this report focuses on selected water-related recreation activities and those relating to the open space plan in the main report.

WHAT DOES THE PUBLIC WANT (DEMAND)?

The public wants more recreation on the shoreline and the Sound. Residents of towns adjacent to the Sound want better local beaches and others seek more regional beaches. The demand for recreation is diverse. The demand for wet storage of 16- to 25-foot boats is ever increasing, but there also is growing demand for small boats for sailing and fishing. The ever present interest in beach swimming is broadened by a growing interest in scuba and skin diving. The demand for campgrounds accessible by automobiles, hikers, canoeists, and bicyclists is increasing.

WHAT IS THE CURRENT CAPACITY OF THE STUDY REGION TO RESPOND TO THESE REQUIREMENTS (SUPPLY)?

There is sufficient beach on the shoreline of the Sound to meet projected need but it is not accessible to the general public. Many beaches with use restrictions do not have the facilities to accommodate more people and would require substantial development if the quality of experience were to be maintained when abolishing use restrictions.

The storage and handling of boats is done largely by the private sector. Many harbors, coves, and inlets are so crowded with slips and moored boats that boating traffic is congested on peak use days. There are few rental boats of any size and no way presently exists to ensure the competence of potential boat renters. Few facilities are available for transient boaters to visit parks, coves, or harbors.

Camping facilities are extremely limited along the hiking trail system and popular canoe routes. Conventional campsites with automobile access are in short supply on Long Island.

SUMMARY OF APPARENT DEFICIENCIES (NEEDS).

There is a growing deficiency of recreation supply in the Study region. The public and private sectors must provide new opportunities for beach swimming, boating, picnicking, and camping. Emphasis should be placed on urban needs such as recreation programs to introduce people to recreation activity,and transportation to the recreation sites.

THE OBJECTIVE AND TENTATIVE MEASURES.

The objective is to provide more outdoor recreation in terms of quantity, quality, diversity, and distribution in environmentally, economically, and socially acceptable ways. Seven alternatives were considered: acquisition and development, redevelopment of flood plain, multiple use of public utility property, increased access to the recreation resources, efficient use of existing parks, incentives to the private sector and not meeting future recreation needs.

EVALUATION

The seven alternatives were evaluated in terms of 54 environmental, economic, and social criteria. Environmental concepts include: (1) a balance between conservation of open space and recreation facility development; (2) effect of water quality on swimming opportunity; and (3) the effect of boating activity on water quality. Economic concepts include: (1) the ability of the private sector to meet future demand; (2) economic constraints on the private sector; and (3) recreation traditionally offered at nominal fee. Social concepts include: (1) upgrading urban recreation programs; (2) providing recreation closer to the urban setting; and (3) diversifying recreation opportunity.

ALTERNATIVE PLANS.

Three plans were considered: one stressing environmental quality, a second, economic efficiency, and a third, a combination of the two.

RECOMMENDATION. A composite plan recommended the following actions:

State Actions

(1) By 2020, acquire and develop 11,000 acres of land
(2) Redevelop for recreation 3.3 miles of shoreline presently located on the flood plain, prior to natural disaster
(3) Develop fund to acquire shorefront property following natural disaster.
(4) Develop and expand existing parks and beaches
(5) Regulate land use in open space system
(6) Pass enabling legislation to allow right of first refusal to the public sector for private recreation resources up for sale
(7) Establish property tax allowance for private recreation enterprise

Local Actions

(1) By 2020, acquire and develop 1800 acres of land
(2) Develop fund to acquire shorefront property following natural disaster
(3) Develop existing parks and beaches
(4) Open parks and beaches to all on weekdays
(5) Expand and diversify urban recreation programs
(6) Develop public marinas

State or Local Actions (New York Only)

(1) By 2020, acquire and develop 700 acres of land

Quasi-Public and Private Actions

(1) Multiple use of watershed lands
(2) Multiple use of public utility lands
(3) Develop recreational ferry routes
(4) Voluntarily alter the work week
(5) Coordinate public transit schedules

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1.0 THE PURPOSE OF THIS REPORT

The purpose of this planning report is to assemble information on the demand for and the supply of outdoor recreation within the Study region, and then to develop an outdoor recreation plan of action. The plan of action evaluates problem-solving techniques, including managerial, programming and facility development, with their associated environmental, economic, and social impacts. Alternatives are weighed and an overall, long-range program is proposed.

To accomplish this purpose, the planning report --

- Examines the demand for selected kinds of outdoor recreation within the Study region and translates the demand to site and facility requirements.

- Summarizes the current supply of recreation.

- Identifies the major outdoor recreation needs, and alternative ways to meet these needs.

- Evaluates the planning alternatives and finally recommends a plan of action to provide more recreation within the Study region.

This report was prepared at field level by a Recreation Work Group consisting of representatives of the following agencies: the Bureau of Outdoor Recreation (chair agency), the states of Connecticut and New York, the U. S. Army Corps of Engineers, the Nassau-Suffolk Regional Planning Board, the Tri-State Regional Planning Commission, the Citizen Advisory Committee, and the Research/Planning Advisory Committee.

Neither the contents nor recommendations contained in this document necessarily reflect the official views of the Bureau of Outdoor Recreation or the other agencies represented on the work group.

2.0 WHAT DOES THE PUBLIC WANT (DEMAND)?

2.1 Dimensions.

A wide variety of recreation programs and areas must be made available if the Sound and its shoreline are to be utilized to their full potential as recreational resources. For simplicity and emphasis, this report focuses on beach swimming, boating, picnicking, and camping. Sport-fishing is discussed in the planning report on Fish and Wildlife. These activities, in addition to being the major recreation activities of the coastal area, are most commonly provided by the public sector. It is therefore appropriate that these activities be the focus of this report because the goal of this report is a plan of action to organize the scarce resources of land and public money for recreation.

The methodology employed to quantitatively predict future demand for beach swimming, boating, picnicking, and camping is an adaptation of the methodology developed in the North Atlantic Water Resources Study (NAR Study) (12) completed in May 1972.

Demand was first measured in activity days (Section 2 of this report) and then converted to resource requirements (Section 3 of this report).

Four factors were used to estimate demand: per capita participation rates in selected activities; population; a facility coefficient to estimate the percentage of demand to be met by specific facilities; and a distribution factor to distinguish between regional and local demand.

Participation Rate. The recreation participation rate expresses the estimated number of days the average person participates in a particular activity. The rates used are based on the NAR Study, which in turn were derived from census data reported in the 1965 Survey of Outdoor Recreation Activities for the New England and the Middle Atlantic States. The rates were projected into the future in the NAR Study using the technique of multi-variate analysis to correlate them with projected trends in socio-economic characteristics such as income, education, occupation, age, sex, and leisure time. Forecasted change in socio-economic and leisure time factors was used to predict participation rates for the years 1980, 2000, and 2020. To correlate the data derived from these rates to the 1990 bench mark planning year for the Long Island Sound Study (LISS), a straight-line, mathematical interpolation was made between 1980 and 2000 year data.

Population. County population data was provided by the Bureau of Economic Analysis, U.S. Department of Commerce and is based upon the Series E national population projections. By multiplying the participation rate times county population projections, future summer season days for various recreation activities were estimated for the county population bordering the Sound.

Facility Coefficient. In order to correlate the estimated activity day demand with facility requirements, an estimate was made of the percentage of recreation activity day demand which should be met in conjunction with facility units. Specifically, what percentage of the camping demand should be met by campgrounds, picnicking demand by tables, swimming demand by beaches, and boating demand by ramps and slips? These factors are called facility coefficients. The magnitude of the facility coefficients was derived from information contained in various recreation plans developed in the Study region and was further refined with information gained from informal discussions with resource managers and planners.

Distribution Factor. Distribution factors were developed for this Study to allocate demand between resident (local) and non-resident (regional) sources. The factors consider both supply and distance. The south shore of Long Island, for instance, provides a viable alternative to north shore beaches. The Connecticut portion of the Study region does not have such an obvious alternative. However, Long Islanders do not have the number of alternatives for camping that are available to residents within the Connecticut portion of the Study region. Shifting recreation demand to the location of the supply and potential supply of recreation facilities creates a more realistic picture of the potentials for increasing supply to meet demand. For example, Subregion 6 of the Study region has the largest population, but offers the least potential for recreation development. Therefore, a portion of the demand generated in Subregion 6 is shifted to other subregions as non-resident demand. Figure 1 on page 7 shows the boundaries of the 9 subregions.

The demand methodology does not take into account future shifts in technology, social values, available recreation resources, environmental quality, and improved resource management techniques. Appendix B contains further details of the demand methodology and the factors used. Table 1 summarizes the results. The table reports, for example, that if the people presently utilizing Subregion 1 recreation facilities participate at the rate projected for the future, the magnitude of demand by 1990 for that subregion will reach seven million visits to the beaches. Of the seven million visits, the demand from regional sources will be two and a quarter times the magnitude of local (within county) demand (see page B-4).

A qualitative analysis of trails and an urban and regional perspective are also included in this report and were taken into account when incorporating the recreation element into the formulation of the Long Island Sound Regional Study (LISS) plan.

TABLE 1. DEMAND FOR RECREATION FACILITIES OF THE LONG ISLAND SOUND REGION

(Millions of summer season activity days)

Source: Appendix B

1990						2020				
Subregion	Swim Beach	Picnic Sites	Camp Sites	Ramp Lanes	Slips & Moorings	Swim Beaches	Picnic Sites	Camp Sites	Ramp Lanes	Slips & Moorings
1	6.8	.8	1.1	.8	1.4	11.2	1.4	2.0	1.5	2.7
2	3.7	.5	.5	.8	1.5	6.6	.9	1.0	1.7	3.1
3	14.6	2.8	.9	1.0	1.5	23.4	4.7	1.7	1.7	2.8
4	4.7	1.8	.3	.4	1.2	7.6	3.1	.6	.8	2.1
5	5.2	.9	.9	1.3	4.5	8.5	1.6	1.7	2.4	8.2
6	14.3	2.5	.2	1.2	4.1	21.0	3.9	.4	2.0	6.8
7	9.2	3.0	.3	.7	1.6	19.0	6.6	.7	1.7	3.8
8-9	4.6	3.0	1.0	.5	.4	9.5	6.6	2.4	1.1	.9
1-9	63.1	15.3	5.2	6.7	16.2	106.7	28.8	10.6	12.9	30.3

2.2 Regional Perspective

Long Island Sound has been called an urban sea because of its close proximity to 12 million people. This Study came about largely due to the strong attraction of these people to the amenities of the Sound.

Recreational demand is directly related to the numbers of people, the time they have available for leisure pursuits, their financial ability to seek recreation, and the availability of recreation. All of these have greatly increased in recent years and are expected to increase further in the future.

The five million people in the LISS region today are expected to become seven million by 1990 and more than nine million by 2020. This population growth will be accompanied by a four-fold increase in total personal income. Millions more outside the immediate Sound region may be looking to Long Island Sound for their recreation needs in the future, as well as to other regional resources. There are the eight million residents of New York City, many of whom do not yet know of the recreational opportunities of Long Island Sound, but for whom the Sound can represent an important alternative to the south shore of Long Island, the New Jersey shore and the Gateway National Recreation Area.

Using the demand methodology that was described on page 3, we can estimate that by 2020 the region will need 35 more miles of beach for swimming, 1800 more acres of campgrounds, 1600 more acres of picnic grounds, and 46,000 additional moorings.

Long Island Sound can probably never accommodate all of the recreational demands people will increasingly place upon it. Yet it is equally unlikely that these demands can go substantially unmet, that the Sound can "stay as it is." The question, therefore, is not whether the Sound will provide more recreation for more people but rather how it will be accomplished. This report is a plan of action to answer the question of how to provide more recreation for more people.

2.3 Urban Perspective

A look at the Region's people is a look at the recreation demand market area, i.e., the distribution of the population, population density, and income (27).

Figure 1 depicts the distribution of population, population density, projected future concentration of growth, poverty pockets, and populations relying on mass transit within the Study region. The patterns depicted in Figure 1 indicate areas of greatest recreation facility and program need. Ideally, access to recreation should be as convenient

SOURCE: (22)

KEY:

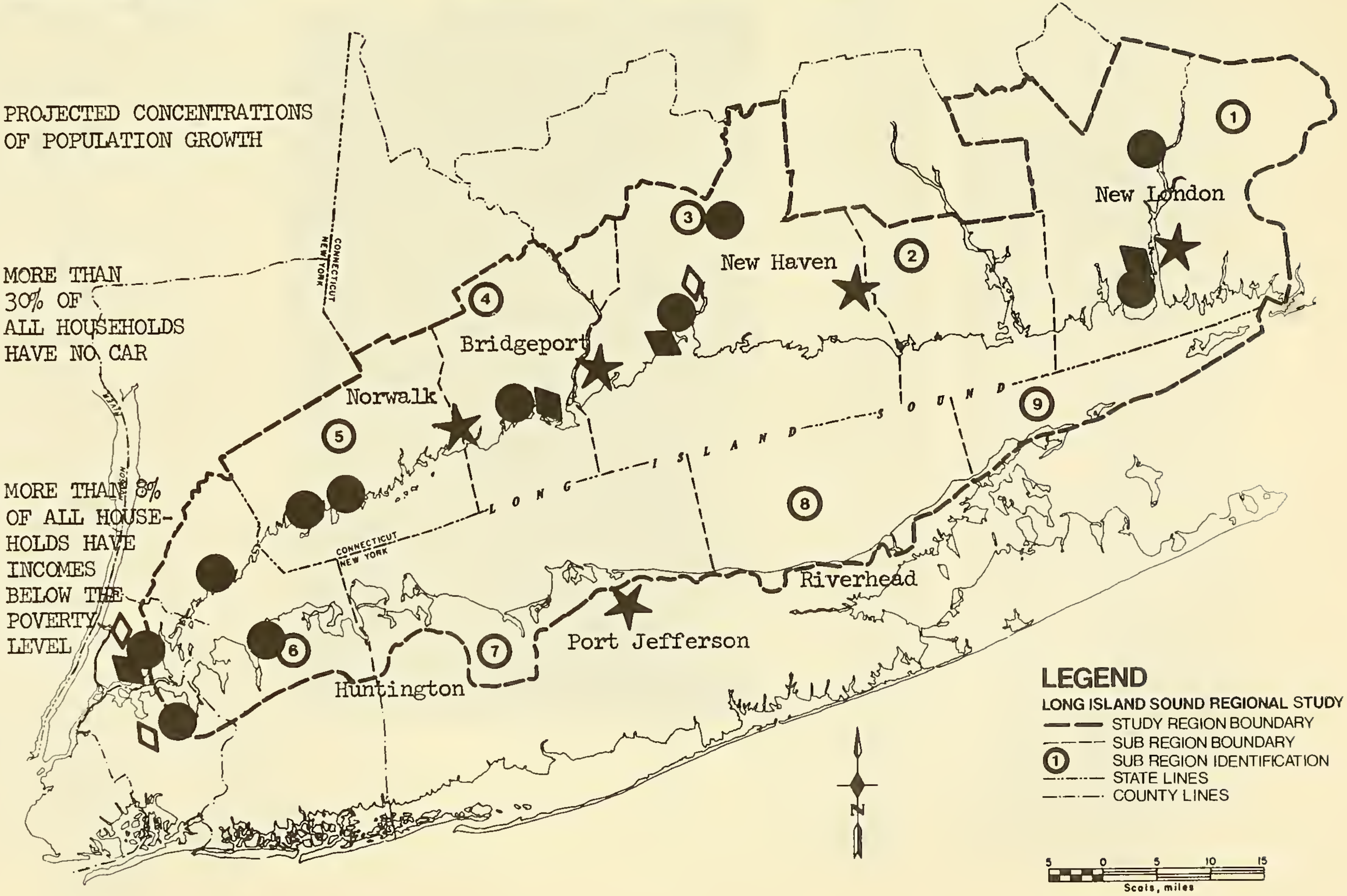
● - POPULATION CENTERS

★ - PROJECTED CONCENTRATIONS OF POPULATION GROWTH

◆ - MORE THAN 30% OF ALL HOUSEHOLDS HAVE NO CAR

◇ - MORE THAN 8% OF ALL HOUSEHOLDS HAVE INCOMES BELOW THE POVERTY LEVEL

FIGURE 1 -- THE REGION'S PEOPLE



for people as possible. Areas of high population density have a greater need for parks and open space in close proximity to the living units than do lower density areas. People living on one acre lots can pursue outdoor recreation in their backyards. They have their own piece of open space while residents of high density areas must share available open space. Poverty pockets are more dependent than higher income areas on public recreation facilities, programs, and transportation. Thus, poverty pockets are like red flags in locating areas with high recreation needs.

There is a growing demand for recreation programs in urban areas. Enrollment is high in outdoor recreation instructional and participatory programs for all age groups, both sexes, and the handicapped (28). Urban residents want to be involved in outdoor leisure activity.

2.4 Beach Swimming

Beach swimming entails much more than just contact with the water; it is also a social experience, i.e., a gathering place for youth or a family outing. In the protected waters of the Sound, children can play with comparatively little supervision. Like so many other recreation activities, it is an opportunity for being and doing together.

A beach offers a kind of linear open space which tends to offset the feeling of congestion in densely populated urban areas. In New York City, where the population is extremely dense, the public beaches represent one of the most attractive opportunities to escape from the summer heat and the city environment. Public beaches are vitally important to a satisfactory standard of living for the urban population. This is reflected by the high demand for beaches depicted in Table 1.

No attempt has been made to measure unsatisfied latent demand for beach swimming, which may be unmet due to lack of access, density of use on peak days, or poorly maintained facilities.

No differentiation in demand is made here between salt water beach swimming and fresh water beach swimming. The assumption is that the estimated demand for beach facilities relates primarily to salt water beaches.

Beach swimming demand was not differentiated into types of beach facilities, i.e., private, town, or regional. It was found, however, during the course of the Study that generally, State beaches are not frequented by local residents (26).

It is conceivable that the demand for beaches by residents of densely populated urban areas would increase substantially if more children were taught how to swim and beaches were made more accessible by public transportation.

The demand generated outside the Study region for beaches on the Sound is primarily from residents of inland Connecticut towns and New York City.

2.5 Boating

Boating requires varying degrees of skill and monetary commitment. Boating is the sixth most popular outdoor recreation activity nationally, and is particularly significant in the Study region.

With satisfactory weather conditions, the Sound is well suited for cruising, sailing, water skiing, fishing, or clamming. The Sound draws recreational boaters from an area larger than the Study region, so that the magnitude of demand on the Sound for boat ramps and slips and moorings, which is depicted in Table 1, is much larger than just the demand generated within the Study region. The magnitude of this non-resident demand is shown in Appendix B.

Recreational boating on the Sound is big business with a large number of equipment sales and service establishments, manufacturers, and marinas. The total value of all craft berthed on the Sound is estimated at 368 million dollars (22). It is interesting to note that the recreational fishing business on Long Island Sound has a larger net value than the commercial fishing business. This subject is covered in greater depth in Ecological Studies: An Interim Report.

No attempt has been made to measure latent demand for boating unsatisfied due to lack of available facilities, sufficient funds, boating skills or because of congested boating traffic in the harbors.

An undocumented, yet apparent trend in boating demand is that the fastest growing interests are in small boat sailing and in trailering larger boats to the Sound.

2.6 Picnicking

Picnicking is one of the most frequently pursued outdoor recreation activities in America, as is reflected in the Study region by the magnitude of picnicking demand depicted in Table 1. Somehow, food tastes better out-of-doors in a refreshing environment. A picnic basket is often part of an automobile sight-seeing trip, a day at a beach, or a visit to a State park where many other outdoor activities are pursued. Ample picnic facilities are an important element of high quality recreation in the Study region.

2.7 Camping

As the average American's everyday surroundings become increasingly developed, there is a diminishing amount of open space to break up his urbanized environment. Many Americans including those in the Study region express a greater desire to experience open space first hand; not just to drive through it, but to spend enough time to really experience it by cooking, eating, sleeping, and just living in an atmosphere of open space.

Camping also provides an economical type of lodging for travellers. People are willing to stop overnight in relatively dense commercial campgrounds with a tent, trailer, or van in order to save money and/or not to be dependent on the availability of motel rooms.

Meeting the demand for camping expressed in Table 1 will enhance the accessibility of recreation resources and provide a balance to recreation facilities of the Study region.

The demand for camping is diverse. Facility preferences range from transient recreationists looking for motel-like convenience, to destination campers loaded with gadgets and desiring sophisticated facilities, to primitive camping buffs desiring minimum accommodations in order to experience a close relationship with nature. Both the New York and Connecticut Statewide Comprehensive Outdoor Recreation Plans (SCORPs) recommend that the private sector provide for the needs of transient campers. As parks are more heavily used in the future, the public sector will most likely limit itself to providing only the resource-oriented, primitive camping opportunity.

Since Connecticut is heavily used by transient recreationists, demand is high for campsites with motel-like facilities near major highways. The camping demand of Long Islanders, on the other hand, is more inclined toward destination camping. There appear to be no easily accessible alternatives to Long Island campgrounds for local residents.

2.8 Trails

The energy crisis is expected to accelerate anticipated increased demand for trails. No quantitative measure of demand for trails in the Study region is available, but an apparent trend is for an accelerated demand for all types of trails, i.e., hiking, bicycling, canoeing, and scenic auto tours.

The automobile is the primary mode of transportation to recreation areas and is an outdoor recreation activity within itself. Scenic drives and cultural and historic tours are popular one day outings which bring urban and suburban dwellers close to their cultural heritage. It is very much a family activity and can be equally enjoyed by young and old. Clearly marked and well advertised scenic highways and tours with good quality roadside parks have the spin-off effect of creating cultural and aesthetic awareness. Refer to the report of the Shoreline Appearance and Design group for further discussion of the importance of scenic, cultural and historic sites.

3.0 WHAT DOES THIS DEMAND MEAN IN TERMS OF THE STUDY REGION (REQUIREMENTS)?

This section deals only with swimming, boating, picnicking, and camping. Up to this stage of the report, demand that has been quantified has been expressed in summer season activity days. This magnitude of demand must be translated into physical requirements to be useful to planners and managers working to satisfy the demand. For clarity, the physical requirements chosen have been limited to those judged to be most significant in terms of resource allocation. For example, the summer season activity day demand for beach swimming has been translated into miles of lifeguard-protected shoreline and acres of beach parking facilities.

The methodology for translating demand into requirements is explained in Appendix C. It takes into account the repetitive use of a facility during the summer season as affected by climate and available leisure time, the size of the parties utilizing a facility, the number of parties utilizing a facility per day, and a spatial requirement for the facility which reflects the existing situation in the Study region.

The spatial requirement figures used to estimate future resource requirements are identical to those used to present current recreation supply data in this report. The spatial requirement figures shown in Appendix C account for the facility itself, for supportive facilities such as parking areas, and for a certain amount of "buffer area," where appropriate. The recreation spatial figures utilized in this report are not meant to be standards for the Study, but rather a reflection of what currently exists. For instance, the spatial figure for camping reflects an average number of campsites per acre presently provided by the private sector. Public sector camping units are usually much more dispersed, but it is believed that a majority of the future need will be met by the private sector.

Spatial units for swimming beaches include linear feet of lifeguard-protected beachfront, total facility area assuming all patrons utilized automobiles for access, and total facility area assuming all patrons utilized bus transportation for access. A comparison of these last two figures suggests the range of acreage needed to provide access to regionally-oriented swimming beach facilities.

The application of these requirement factors to the demand data displayed in Table 1 produces the spatial requirement data found in Table 2. Table 2 represents the key resource requirements necessary to meet the estimated demand.

The suggested spatial figures in Appendix C do not attempt to provide or account for large bands of open space, green belts, stream belts, and the like. Open space requirements are based upon a variety of criteria that will be discussed in greater detail in other reports in this series, especially those on Land Use and Shoreline Appearance and Design.

TABLE 2. RECREATION REQUIREMENTS FOR THE LONG ISLAND SOUND STUDY REGION

Source: Appendix C

	1990							2020						
Subregion #	Miles of Shoreline for Guarded Swimming Beach	Acres of Beach Facilities Serviced by Autos	Acres of Beach Facilities Serviced by Mass Transit	Acres of Picnic Grounds	Acres of Campgrounds	# of Boat Ramp Lanes	# of Slips & Moorings	Miles of Shoreline for Guarded Swimming Beach	Acres of Beach Facilities Serviced by Autos	Acres of Beach Facilities Serviced by Mass Transit	Acres of Picnic Grounds	Acres of Campgrounds	# of Boat Ramp Lanes	# of Slips & Moorings
1	4.2	224	104	71	287	116	5240	5.7	2990	1390	100	450	178	7940
2	2.3	119	56	40	124	118	5450	3.4	177	83	60	210	197	9160
3	9.0	477	222	244	252	134	5590	11.8	626	292	340	390	200	8300
4	2.9	153	71	161	86	64	4190	3.9	204	95	230	130	96	6320
5	3.2	170	79	81	246	192	16170	4.3	227	106	110	380	289	24360
6	8.9	467	218	222	68	175	14770	10.6	562	262	280	100	238	20130
7	5.6	297	139	261	81	105	5890	9.6	509	237	470	160	202	11410
8-9	2.8	149	69	261	269	70	1310	4.8	255	119	470	540	136	2540
1-9	38.9	2056	958	1340	1410	974	58610	54.1	2859	1333	2060	2360	1540	90160

4.0 WHAT IS THE CURRENT CAPACITY OF THE STUDY REGION TO RESPOND TO THESE REQUIREMENTS (SUPPLY)?

The supply data for each of the two States has been drawn from their respective SCORPs. In turn, this data was adjusted to meet the format of Table 2 via methodology described in Appendix C. In order to maintain some consistency between the two States' plans, this process required the following assumptions: (1) the average length of each recorded Connecticut lifeguard-protected beach is approximately 300 feet; (2) the average size of each recorded picnic area in Connecticut is 2.5 acres. The average amount of picnic area per recorded New York Table is .04 acres; (3) the average size of each recorded campground area in Connecticut is 8 acres. The average amount of camping area per recorded New York campsite is .05 acres; (4) the average number of boat launch lanes per recorded boat ramp facility in both States is 2 lanes. The inventory data in Table 3 is based on these assumptions.

The inventory of existing recreation facilities for this summary effort does not take into account the degree to which such facilities are underutilized, inefficiently utilized, or undeveloped. Nor does the inventory data summarized in Table 3 reflect restrictions upon the use or access to the Study region's recreation facilities. In other words, the assumption has been made herein that although a given facility may be restricted in some way - say, by place of residence - it is currently fully utilized on peak days by eligible users.

A series of Recreation Planning Aid Reports prepared by the Bureau of Outdoor Recreation for study participants provides the following information: open space with recreation potential (23); potential marina sites (22); efficient use of recreation property (26); physical and legal access to the shoreline (24); opportunities for multiple use of public and quasi-public lands and utilities (25); trends in urban parks and recreation programs (28); evaluation of the recreation market area (27); and a detailed listing, mapping, and summary of recreation inventory by acreage, facility, feet of shoreline, ownership and use restriction (22, 24, 26, 27, 28).

4.1 Regional Perspective

The Long Island Sound shoreline has a character unique from other nearby shorelines. Its waves are smaller than an ocean shoreline. Its sand is neither as abundant or as pure as the sands of Cape Cod, the south shore of Long Island, or the New Jersey coast. It has fewer coves and inlets than those protected by barrier beaches on the south shore of Long Island or New Jersey. The Sound shoreline, however, has an aura of maritime splendor, of lobster pots, of fife and drum, of antiquity, of New England. This is the strength of its character. This is the atmosphere which must be cherished and nourished and enjoyed.

The Study region is rich in developed and undeveloped recreation resources. Those with regional significance are shown in Figure 2. There are 12 regional parks totalling more than 5,770 acres on the shoreline plus dozens of smaller parks (22). There are 489 marinas with a total of 43,900 slips

TABLE 3. RECREATION SUPPLY FOR THE LONG ISLAND SOUND STUDY REGION

Source: (22)

Subregion	Miles of Shoreline for Guarded Swimming Beach	Acres of Picnic Grounds	Acres of Campgrounds	# of Boat Ramp Lanes	# of Slips & Moorings
1	1.6	45	224	56	4,185
2	.9	20	72	52	4,094
3	5.3	200	184	60	4,367
4	1.4	60	64	24	2,867
5	1.2	53	152	84	12,617
6	3.8	91	5	50	11,882
7	3.6	9	0	28	3,473
8-9	.7	69	17	6	437
Total	18.5	547	718	360	43,922

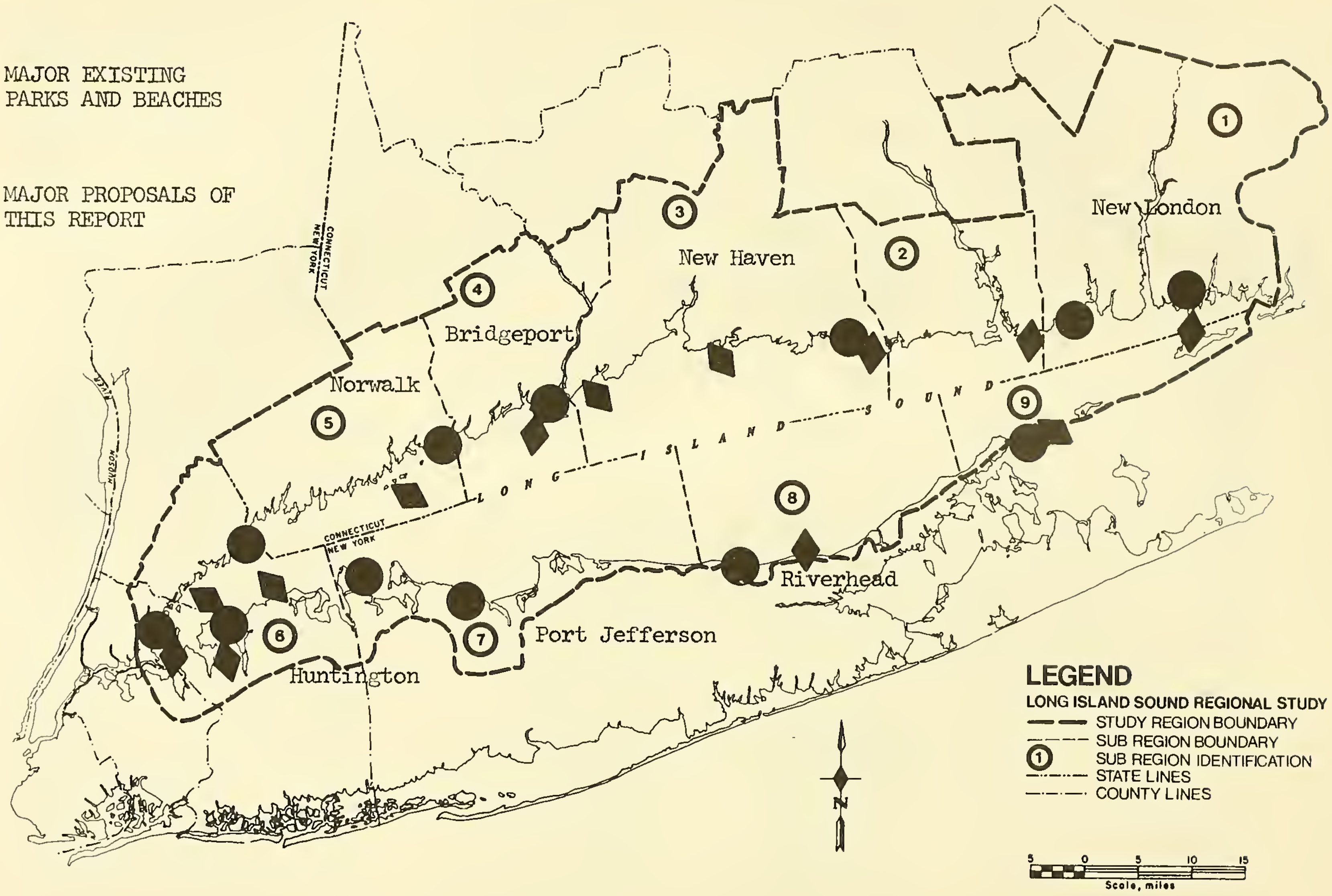
SOURCE: (27)

FIGURE 2 -- THE REGION'S RECREATION RESOURCES

KEY:

● - MAJOR EXISTING PARKS AND BEACHES

◆ - MAJOR PROPOSALS OF THIS REPORT



and moorings on the Sound and its tributaries; with 28 sites that can accommodate 35,900 more boats (22). There are six municipalities with facelifting plans for their harbors (17). Approximately 1,500 particularly scenic, cultural, or historic sites are located on the shoreline (P-3)*. Seven major natural areas line its shores. Scenic highways, trails, and tourist attractions abound and proposals for more have been made. Many islands in the region are being used and more are being proposed to be used for recreation.

4.1.1 Private Sector. Both New York and Connecticut SCORPs recommend that the private sector be encouraged to provide a wide range of recreation opportunities. It is estimated that at least 50 percent of all recreation opportunity nationwide is directly atributable to the private sector (19). The private sector is relied on to provide many of the recreation opportunities in demand today. The percent of recreation facilities which are owned and operated by the private sector in the Connecticut portion of the Study region is presented in Table 4. Dollars spent for private sector recreation facilities and programs are in effect multiplied many times in the local economy.

Many outdoor recreation programs and facilities provided by the private sector are in precarious financial position. Specific financial problems confronting private recreation entrepreneurs include:

- the high investment - low return characteristics of some enterprises
- lack of familiarity with the features of recreation enterprise by potential lenders
- lack of borrowers collateral
- low profit margin
- seasonality of recreation activity which leads to limited income and difficulty in retaining trained employees
- burdensome property taxes that result from the high land value that often accompanies advantageous recreation properties
- liability of land owners for injuries sustained while recreating
- difficulty in obtaining insurance policies
- high rate of theft and vandalism to facilities and vegetation.

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* Symbols in parenthesis which begin with (P-) refer to the planning reports of the different LISS work groups. See Appendix A, page A-3 for the complete list.

TABLE 4. PERCENT OF RECREATION AREAS OWNED AND OPERATED BY THE PRIVATE SECTOR
(Connecticut Subregions Only)

Source: (22)

	Connecticut Subregions				
	1	2	3	4	5
Total, All Recreation Areas	54	59	41	43	47
Percent of Recreation Areas By Type of Facility:					
Picnic Grounds	39	50	27	21	24
Campgrounds	86	100	87	100	100
Beaches	55	53	48	42	40
Boats	62	73	58	21	60

4.1.2 Transportation. Regional recreation is largely provided by automobile. The highway system in the Study region is depicted in Figure 3. Regional beaches on the Sound with four lane access roads include Rocky Neck, Hammonasset, Sherwood Island, Playland, Orchard, and Sunken Meadow (24).

The original intent of the Long Island parkway system (included in Figure 3) was to combine sight-seeing, driving for pleasure, scenic views via overlooks, and pastoral views with transportation needs. The congestion now encountered in the western section of the planning region, particularly on summer weekends, detracts from the intent of the parkway system.

Traffic jams, congestion, accidents, and breakdowns have thwarted the plan to have people pass through parkways to get to parks. Increased traffic has resulted in physical changes of the parkways such as additional lanes, barriers, and access points which detract from the original aesthetic intent of the parkways. The scenic strips originally intended as an environmental buffer zone are being narrowed to provide for an increased volume of traffic.

The fact that weekend peaks of traffic on some bridges in New York City surpass those reached on weekdays is an indication that the journey to play may generate more traffic congestion than the journey to work.

Solving this parkway dilemma will require comprehensive planning which fully considers future trends in the demand and use patterns of recreation. Future planning efforts must concentrate on implementation of a coordinated system of highways and mass transit with adequate parking facilities where necessary. Somehow, a way must be found to lure the recreation traveler away from the convenience of his automobile to a more efficient mode of transportation.

Access to recreation areas by mass transit dwindles rapidly once one leaves metropolitan New York, so that few recreation options are open to New Yorkers who do not own automobiles. Compared to national standards, a low percentage of New Yorkers travel by automobile. Approximately four million people do not have a family automobile. This is due to a lack of adequate parking facilities, high automobile theft rates, special household composition (age, etc.), and the large number of low income families. One million people or 11-1/2 percent of the population of New York City are below the poverty level. The problem of few recreation opportunities for New Yorkers has led Congress to authorize development of the Gateway National Recreation Area in New York and New Jersey.

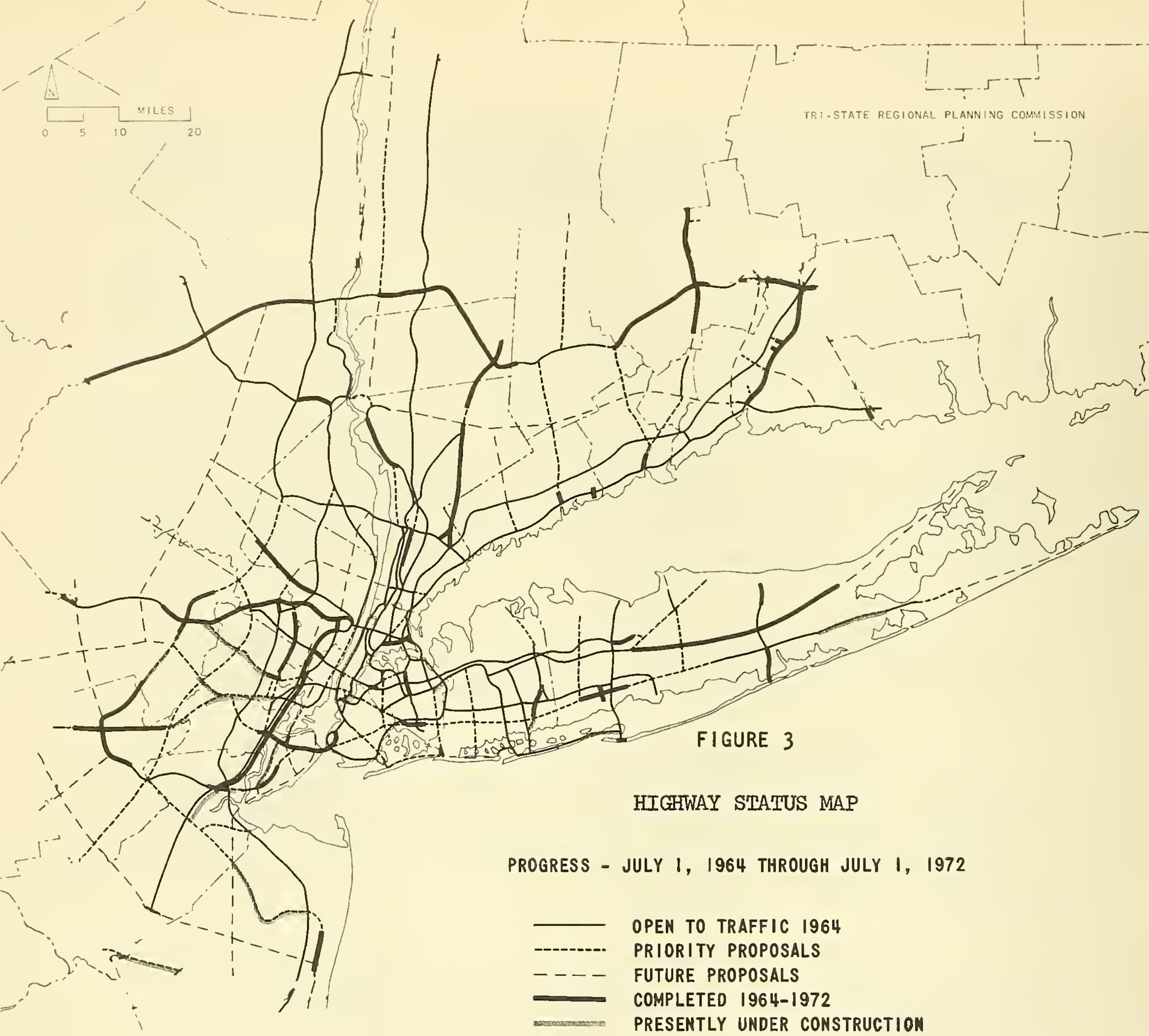


FIGURE 3

HIGHWAY STATUS MAP

PROGRESS - JULY 1, 1964 THROUGH JULY 1, 1972

Source: Tri-State Regional Planning Commission

The problem of mass transit access to recreation areas has been compounded by rising fares. As the cost of mass transit travel to recreation areas increases, patronage of the mass transit system decreases by the very people who most need the service: the poor, the old, and the young.

Recreational use of the Study region rail system poses many problems. The longitudinal network of highway and rail corridors in the Study region is quite extensive, but particularly for rail travel, there is a lack of transverse mobility from the train stations to the shoreline of the Sound.

At present, there are few beaches in the Study region which are reasonably accessible by rail. Seaside Park at Bridgeport, Connecticut is one of the few such areas. If we are to increase the utilization of the shoreline, ways must be found to move people from the so-called "transportation backbones" to the shoreline of the Sound.

Recreational use of trains for a day on the beach is generally socially unacceptable for higher income groups. The independence, convenience, comfort, and privacy of an automobile is very important. Also the paraphernalia that people utilize while pursuing activities cannot conveniently be carried on public transportation. These considerations must be taken into account when planning the use of a mass transit system for recreation with satellite parking lots.

Transverse access across the Sound is available by ferry boat between Port Jefferson, New York, and Bridgeport, Connecticut, and between Orient Point, New York, and New London, Connecticut. The old excursion boats of yesteryear have long disappeared from the scene, and there is no longitudinal ferry service on the Sound. Re-establishing lengthwise boat trips on the Sound could increase accessibility to recreation areas. The slow rate of boat travel limits this potential to short distance one-day excursions or more extended weekend outings.

However small, passenger-only ferries can provide efficient and environmentally acceptable access to beaches, islands, and peninsulas from downtown docks or shorefront public parking areas, in addition to providing a unique and pleasant recreation experience. Recreational ferries have successfully operated for more than half a century in many European countries, and in the United States similar ferries are presently operated in San Francisco, Los Angeles, Martha's Vineyard and Nantucket, and Greenwich, Connecticut, to name a few.

To enhance local access to recreation resources, many of the towns in the western portion of the Study region have local beach bussing programs. These are inexpensive, well scheduled, and well patronized, but they are restricted to local residents. As a consequence, mass transportation for recreation is not regionally oriented or coordinated. To create an effective recreation mass transit system, one that provides the entire population with alternative routes and access to areas, the existing rail, bus, and ferry boat systems must be expanded within a comprehensive coordinated scheduling

SUNKEN MEADOW STATE

and service framework.

4.1.3 Use Restrictions. One major responsibility of a park manager is to provide some predetermined quality of experience for his clientele in terms of density of use and environmental amenities. Limiting access to parks and beaches is an effective management tool for controlling the volume and/or type of users. Access is usually restricted to those persons contributing monetarily to the ownership and/or maintenance of a facility.

Use restriction takes several forms. For public facilities, access to the property may be limited by the mode of transportation permitted or encouraged. By restricting buses carrying residents and/or non-residents, the restriction can discriminate against social class and/or residence. Restricting automobile parking near the park or beach tends to discourage all but local use.

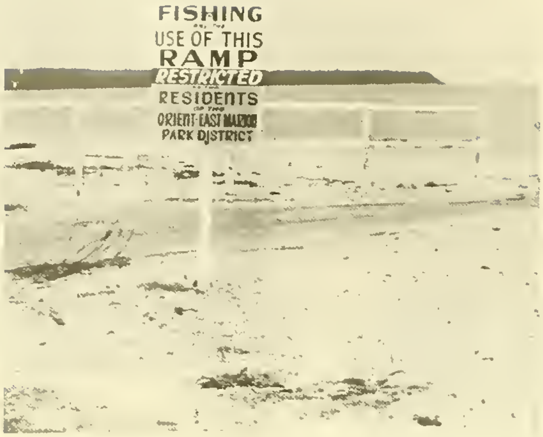
Different fees are often utilized for resident versus non-resident users. This approach compensates for the added maintenance cost of increased use, a major management concern.

Many beaches are simply restricted to residents who contribute to the local tax base. In some instances, identification cards are issued and beaches are guarded.

By restricting beaches to residents who contribute to the local tax base, park managers also discriminate against those people who need access to the water to pursue activities other than swimming, such as skin and scuba diving, and fishing. These activities do not require a guarded beach but only access to rocks, jetties, and piers where swimmers are not likely to gather. Refer to the planning report on Fish and Wildlife for further discussion of access for fishing.

For private country clubs or day camps, limited membership often is one of the most attractive features of the facility. Restricted use enhances fellowship among members and assures some degree of accessibility to the club's recreation facilities. The private sector fulfills such needs and as the standard of living continues to rise in the Study region, so should the market for more restricted recreation facilities.

Use restriction of recreation properties in the Study region is a common practice. In its inventory of recreation properties, the State of Connecticut recorded any use restrictions associated with property. A portion of that data is presented in Table 5.


FISHING
USE OF THIS
RAMP
RESTRICTED
RESIDENTS
ORIENT-EAST MARION
PARK DISTRICT

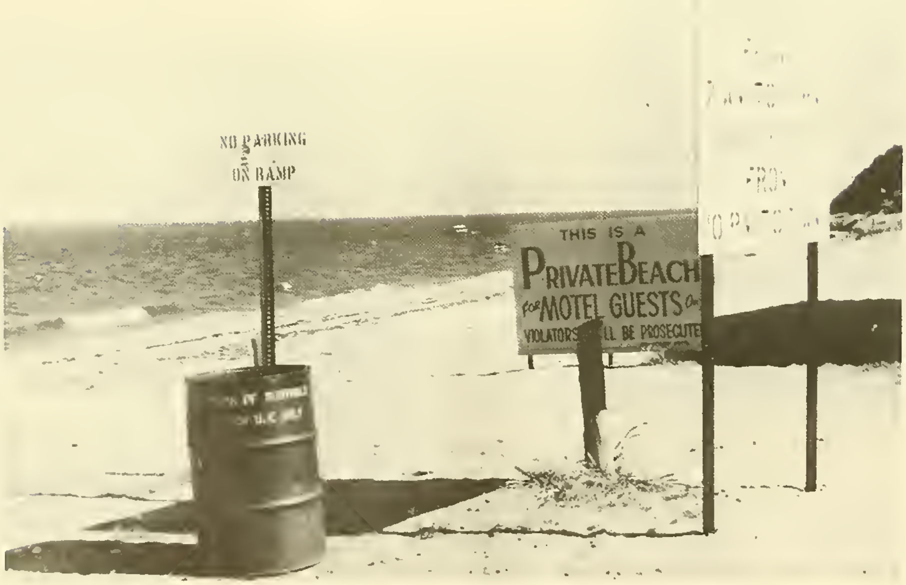

NO PARKING
ON RAMP
THIS IS A
PRIVATE BEACH
FOR MOTEL GUESTS
VIOLATORS WILL BE PROSECUTED

TABLE 5. USE RESTRICTIONS ON RECREATION FACILITIES
(Connecticut Subregions Only)

Source: (22)

	Connecticut Subregions				
	1	2	3	4	5
Total Number of Recreation Areas	265	128	547	167	81
Use Restricted	58	30	146	31	30
Nonrestricted Use or Unknown	207	98	401	136	51
Number of Restricted Recreation Areas by Type of Facility:					
Picnic Grounds					
Use Restricted	5	3	20	1	11
Nonrestricted or Unknown	13	5	60	23	10
Campgrounds					
Use Restricted	20	7	12	1	13
Nonrestricted or Unknown	8	2	11	7	6
Beaches					
Use Restricted	13	8	53	4	11
Nonrestricted or Unknown	16	7	41	20	10
Boats					
Use Restricted	23	11	37	12	5
Nonrestricted or Unknown	99	56	71	22	9

4.2 Urban Perspective.

Recreation resources were summarized and parks and recreation personnel were interviewed from the following ten urban areas in the Study region: Bridgeport, Fairfield, Glen Cove, Huntington, New Haven, New London, New York City, Norwalk, Stratford, and Port Jefferson (28). Park managers indicated that their existing park system was difficult to maintain properly, and that any new acquisitions of park lands would have to be accompanied by financial commitment to adequately manage the property. On an average, these nine urban areas excluding New York City, had five shoreline parks, 30% of their shoreline on the Sound in park or beach facilities, six shoreline park acres per 1,000 population, and 57 feet of lifeguard-protected beach per 1,000 population (28). Four of the communities had public marinas.

Funding priorities in the park and recreation departments were, in order of preference, programs, maintenance, development and acquisition. These are generalized priorities which do not reflect specific concerns unique to each urban area.

The recreation programs in these ten urban areas presently focus on competitive sports for young boys, outdoor fairs, concerts, and art shows, and tennis and golf instructional programs for adults. Programming trends for the future aim at providing a greater variety of opportunities to a broader spectrum of people. Programs will attempt to reach girls, families, the aged, the handicapped, ethnic groups, and teenagers. Facilities in the planning stages include lacrosse, soccer, and hockey fields, tennis courts, bike routes, and trails.

4.3 Beach Swimming.

Facilities for beach swimming serve more people during the summer season than any other recreation facility on the Sound.

Twelve beaches on or near the Sound have regional significance and include 8.4 miles of lifeguarded beach. These beaches host 15 million patrons per season and yet only one beach has regularly turned away patrons on crowded weekends (26).

On an average, 82 percent of the shorefront along regional swimming beaches is protected by lifeguards (26). Large beaches farther from population centers tend to have a smaller percentage of their total beach length protected. State operated beaches have a shorter season and fewer hours per day for lifeguard coverage than local beaches. Funding appears to be the major constraint to expanding safety coverage and capacity of use on State beaches (26).

Small town beaches usually do not have enough depth, quality of sand, feet of shoreline, inland backup acreage, or quality access to expand their capacity to have significant regional potential. Management of town beaches is often hindered by limited budgets for maintenance and safety. Beaches in urban areas have serious problems of vandalism, crime, and litter (26).

Additionally, some form of use restriction such as parking or entrance fees is used at most of the town beaches on the Sound. In this way, local governments endeavor to protect beach property to provide the greatest possible amenity for residents and at the same time to reduce maintenance costs. Due to the high value of shoreline property, the magnitude of the demand, and the seasonal and weekend nature of the activity, it is anticipated that the majority of the demand for beach swimming will be met by the public sector.

Residents of Connecticut towns inland from coastal towns are possibly the ones most adversely affected by limited beach access. Thirty-five percent of the Connecticut beaches have some type of use restriction (22, 24, 26). Although higher percentages of New York towns may have restrictions on beach use, on Long Island the effect is not as stifling as in Connecticut since the towns are larger and generally extend to the south shore.

A number of environmental factors have a profound effect on beach swimming. Some of these, in order of importance, are weather, water temperature, sea animals, tidal fluctuation, and water quality (26).

In the analysis of beach swimming on the Sound, the supply of potential beach resources was reviewed along with the supply of existing facilities. Except for the eastern end of Long Island, almost all good quality natural beaches on the Sound are presently being utilized to some extent for beach swimming and related activities. State beaches are located in a more natural setting than are local beaches, but the local beaches tend to be closer to the people (26). Bluff Point, Harkness Memorial, and Caumsett are the State parks on the Sound which do not have swimming facilities along the waterfront. These natural waterfronts are unique to the Sound, and there is strong sentiment against developing them as swimming beaches.

Since the shoreline of the Sound is largely developed and privately owned, as is quantified in the report on Shoreline Appearance and Design, almost any new regional beach facility would have to come about from redevelopment of the private shorefront property or the expansion of local or private beach facilities.

4.4 Boating.

Existing boating facilities are not meeting the needs today for storing or handling boats, and the future does not look promising. Waiting lists for slips at both public and private marinas are often reported to be 200 to 300 requests. On peak use days, boat ramp facilities and access roads to them are clogged with people, cars, and trailers. Recreational boating traffic in many harbors is already congested on weekends due to the volume of traffic on peak use days, narrow channels, and the profusion of moored boats. Few slips and little protected water is available for overnight use by transient boaters, and regional parks and islands on the Sound do not have ample facilities for boat access.

Present boating facilities and use patterns are not efficient in the handling and storage of boats. A 1973 survey of 25% of the Westchester County, New York City, and Long Island marinas open to the public revealed that only 17% had boat and motor rentals (16). Insurance rates on rental boats are high, partly since there is no way to judge the competence of the renter to handle the boat. No mandatory system exists to educate boat operators about proper boating navigation, safety, and anti-pollution practices. A vast majority of craft on the Sound are privately owned. A national survey of private boat owners revealed that the average boat was in use only 200 hours per year (6). Most of this use occurs on summer weekends. Thus, there are thousands of slips and moorings that are occupied by craft which are utilized a very few days per year. Much of the limited amount of protected water surface on the Sound, which are prime use areas for small craft and for transient boaters stopping overnight, is being utilized for permanent mooring space; and moorings require more space than any other method of storing a boat. Trailering boats is also inefficient in terms of the time needed to launch and retrieve a boat and the space required to park a car and trailer along the waterfront during use of the boat (see Appendix B).

Rental of slip facilities by private marina operators seems to be in a tenuous situation. The above mentioned survey (16) set the value of the marina industry on Long Island at 55 million dollars, a much higher value then either the potato or duckling industry on Long Island. However, the profit margin for providing slip facilities by the marina industry on the Sound is very low. The above mentioned survey (16), showed that the average fair market value per marina was 370,000 dollars. The average margin of profit from slip rental amounted to 4,000 dollars. This is an annual profit margin of approximately one percent of the total investment.

Marina facilities are being lost to other shoreline uses. The above mentioned survey (16) indicated that 46% of the marina owners surveyed would sell their business if fair market value was offered and another 19% would "consider it." Thus 65% of the industry surveyed is in danger of being lost to a more profitable land use. The average age of the inventoried marina facility was 27 years.

Existing marinas have limited room to expand. On an average, 69% of the Connecticut marinas physically have room to expand, and 26% have applied for permits to expand (22). No measure was made of the magnitude of intended expansion. The above mentioned survey (16) shows marina operators in the New York portion of the Study region indicate virtually no room for expansion.

Problems besetting the marina operators include obtaining maintenance dredging permits, paying high property tax, obtaining insurance policies, controlling theft and vandalism, and managing with low profit margins (16).

4.5 Picnicking.

Picnic facilities have traditionally been provided at no charge by the public sector. Fees are charged, however, for picnicking at some Connecticut State Parks where picnicking tends to be an ancillary activity. Local picnic facilities seem more prevalent than regional facilities. Picnic areas are used for a much longer season than are beaches, and yet not all regional beaches have major picnic grounds. Sherwood Island and Harkness Memorial State Parks in Connecticut provide possibly the most natural setting and unobstructed view of the Sound of any of the regional picnic areas.

Picnic areas seem particularly lacking along scenic highways, hiking trails, and popular canoe and bicycle routes.

4.6 Camping.

Both New York and Connecticut have a policy that campgrounds in State parks should provide only primitive facilities. Campgrounds in some Connecticut State parks are being redeveloped from 20 sites to five sites per acre. Wildwood State Park is the only State park within the New York portion of the Study region with a major campground.

Although hiking, canoeing, and cycling are fast growing in popularity, particularly now in the midst of the energy crisis, no primitive camping facilities or hostels are incorporated into existing backpacking, canoeing, and bicycling trail systems.

Watershed and forest lands in Connecticut have excellent potential for primitive camping via backpack, boat, bicycle, or automobile. Undeveloped portions of the north shore of Long Island also afford potential for camping in a spectacular setting.

Many day camps are in operation near urban centers in Connecticut, but there is a lack of group camping facilities open to the general public.

The Connecticut SCORP indicates that today there are 42 commercial campgrounds in Connecticut as compared to none in 1960. Private sector campgrounds center around State parks and beaches and tourists attractions. Problems besetting private campground entrepreneurs include rising property tax, vandalism, and the seasonality of the activity.

4.7 Trails.

A map and listing of existing and proposed hiking trails is shown in Appendix D. Most hiking trails are found in Subregions 1, 2, and 3 and were developed and are maintained by voluntary associations. Access is usually granted across private property via verbal agreements with landowners, providing that the privilege of access is not abused. Existing hiking trails do not interconnect as well as they might in terms of a regional system.

Watershed, forest, and agricultural lands lend themselves well to multiple use of hiking trails. The Connecticut Waterworks Association, a coalition of water companies in Connecticut, has invited the Connecticut Park and Forest Association to design a trail system on water company lands.

The best potential for hiking along the Sound coastline is along the shoreline at the base of the bluffs of Subregions 8 and 9. Bridle trails in Subregion 5 are well utilized by the large population of pleasure horses. Five significant canoe routes are found in the Study region: the Quinabary and Shetucket Rivers in the Thames drainage system, and the Connecticut, Housatonic, and Nissequoque Rivers.

Bike trails are generally found in urban areas with no known "cross country" trails in the Study region. Most municipalities and many regional planning agencies have plans for developing bike trails within the next five years (28). Bicycles are not generally allowed on mass transit, i.e., bus or train.

Several self-guided automobile tours of cultural and historic sites are available in Connecticut. Subregions 1, 2, 3, 8 and 9 all have highways through very scenic areas (P-3). Driving for pleasure on these highways can be inconvenient since picnic and sanitary facilities are not prevalent on scenic highways in the Study region and present ferry service across the Sound does not lend itself to one day outings.

5.0 SUMMARY OF APPARENT DEFICIENCIES (NEEDS)

A summary of apparent deficiencies is presented in Table 6. These deficiencies were calculated simply by subtracting current supply figures shown in Table 3 from projected requirement figures shown in Table 2. Due to rounding, the figures in Table 6 are not always exactly the result of subtracting Table 3 from Table 2.

The apparent deficiencies shown in Table 6 illustrate the magnitude of the task of finding ways to most realistically meet the recreation resource needs of each of the subregions for the Long Island Sound Study Region.

Besides quantity, there is a need to maximize quality, distribution, and diversity of outdoor recreation opportunity in the Study region. Discussion in this report will focus on techniques which tend to enhance all four of these aspects of outdoor recreation opportunity.

5.1 Regional Perspective.

The outdoor recreation resources of the Study region are a part of a larger system of complementary resource demands, supply and needs. This larger system includes scenic (P-3), cultural (P-3), watershed (P-2), forest (P-1), agricultural (P-1), flood plains (P-5), stream belt (P-1), steep slopes (P-1), mining (P-9), power transmission (P-10), and public property resources (P-11). Uses of these resources can be made complementary to each other in an open space system. Integrated use must be made of these open space resources if maximum benefit is to be achieved.

Accessibility is the key to providing more recreation in the Study region. If the people (depicted in Figure 1) are to enjoy the recreation resources (depicted in Figure 2), then a regional transportation plan must be developed to make access convenient, enjoyable, and economical.

At the present time, the transportation corridors in the Study region do not provide access to the recreational resources of the Sound. This situation must be rectified if the Sound's recreation resources are to be used by all.

Leisure time transportation can be a recreation experience as well as a means of access to a recreation area. Scenic highways, bike trails, bus and boat tours all are pleasurable in themselves as well as terminating at points of interest.

No single transportation system can serve all of the diversified recreation activities enjoyed in the Study region. All transportation systems must be coordinated. Mass transportation scheduling could be coordinated, expanded, and combined with automobile corridors and major parking areas to ensure maximum recreation use of park lands.

TABLE 6. PROJECTED RECREATION DEFICIENCIES FOR THE LONG ISLAND SOUND STUDY REGION

Source: Table 2 minus Table 3

	1990					2020				
Subregion	Miles of Shoreline Guarded Beach	Acres of Picnic Grounds	Acres of Camp-Grounds	# of Ramp Lanes	# of Slips and Moorings	Miles of Shoreline Guarded Beach	Acres of Picnic Grounds	Acres of Campgrounds	# of Ramp Lanes	# of Slips and Moorings
1	2.6	26	63	60	1,055	4.1	55	226	122	3,755
2	1.4	20	52	66	1,356	2.5	40	138	145	5,066
3	3.7	44	68	74	1,223	6.5	140	206	140	3,933
4	1.5	101	22	40	1,323	2.5	170	66	72	3,453
5	2.0	28	94	108	3,553	3.1	57	228	205	11,743
6	5.1	131	63	125	2,888	6.8	189	95	188	8,248
7	2.0	252	81	77	2,417	6.0	461	160	174	7,937
8-9	2.1	192	252	64	873	4.1	401	523	130	2,103
1-9	20.4	793	692	614	14,688	35.6	1,513	1,642	1,180	46,238

There is a need for short-run, passenger-only recreational ferry service. Water born transportation could be used as a major vehicle for maximizing access to the recreation resources of the Sound. It would lend itself particularly well to providing the densely populated areas on the Sound with enjoyable transportation to major recreation attractions. A well coordinated transportation system of buses, trains, highways, trails, and ferries could provide a true regional perspective to the Sound's recreation resources.

A suggested framework for a leisure time transportation system designed to join the people with the recreation resources in an efficient, convenient manner would include major highway, rail, ferry, and trail routes connecting regional recreation resources. Various types of transportation should converge to provide a variety of service options at critical connecting terminals. These connecting terminals should include rail and bus terminals, automobile parking facilities, and should be in close proximity to ferry service.

This type of a system may be futuristic and for the 2020 planning horizon. The population of the counties in the Study region today is predicted to double by that time to a total of 9 million people. Outdoor recreation will be an important part of this future lifestyle and access to the recreation resources will be a key to quality of life.

5.2 Urban Perspective.

The current energy crisis has brought renewed attention to urban recreation. Let us hope this attention will soon be followed by financial support for acquisition, development, operation, and maintenance. Innovative recreation programs, dedicated recreation specialists, involved organizations, and enthusiastic participants are all part of the expanding urban recreation picture in the Study region. This picture is expanding in terms of number of participants, types of programs and facilities available, and kinds of people served.

The private sector must continue to improve urban outdoor recreation.

5.3 Beach Swimming.

There is an inadequate supply of lifeguard-protected beach even now -- particularly where population density is high and for residents of inland Connecticut towns. This deficit is expected to grow to about 20 miles of beach by 1990 and to 35 miles of beach by 2020.

The private sector and local and regional beaches of the public sector each meet different types of beach swimming demand and are all important to providing diversity and distribution of beach swimming opportunities. Public sector beaches need to be efficiently used with adequate access provided for swimming, fishing, and skin and scuba diving. More regional beaches which are open to the general public need to be provided to meet the regional demand for beach swimming on the Sound.

5.4 Boating

The outdoor recreation facilities projected to be most deficient for both the 1990 and 2020 time frame are those for boat handling and storage on the shoreline of the Sound. The anticipated demand for wet storage facilities for boats in the Study region outstrips existing facilities by 15,000 by 1990 and an additional 20,000 by 2020. Projected demand for trailered boat launch ramps is expected to exceed supply by 600 ramp lanes in 1990 and an additional 500 by 2020.

Wet storage of boats via slips and moorings requires occupation of large amounts of water surface and shoreline (see Appendix D1). Each boat launch lane requires one-third acre of land for parking of vehicles and trailers.

Many coves and harbors are presently saturated with wet storage facilities and/or recreational boating traffic on peak use days. Estimations of the carrying capacities of harbors, coves, rivers, and inlets to the Sound have been made in terms of boating traffic and wet and dry handling and storage of boats (see Appendix D2) (22).

It was concluded that the projected 1990 demand for wet storage facilities could be met and one half the projected demand for trailered boat facilities could be met, but any future demand could not.

An estimated 83% of existing boat slips are provided by the private sector which is not expected to expand at a rate fast enough to meet demand. Moorings, which are spatially the least efficient way to store boats, are usually under town jurisdiction. The U.S. Coast Guard grants mooring permits and does not foresee a major increase in granting them.

Thus, to meet the quantitative demand, there is need to introduce to the shoreline a more efficient way of storing and handling boats and a need, when the carrying capacity of the Sound is reached, to more efficiently utilize the boats themselves.

The distribution of boating facilities needs to be enhancedd, particularly for trailered boats, in order to decrease travel time, trailer traffic on the highways, and congestion at the facilities. Storage facilities at the shoreline are pretty well distributed, but could be enhanced by providing more at population centers.

At the present time, boating facilities cater almost exclusively to the private boat owner. Diversity of opportunity needs to be increased for the boating enthusiast who does not own a boat or who enjoys different types of boating. In order to decrease insurance rates on rental boats and insure boating safety, there is a need to provide a uniform standard for the boat owner to judge the competence of the renter to handle different classes of boats.

The quality of boating on the Sound depends on water quality (P-2), shoreline appearance and design (P-3), and convenience of handling and storing the craft (P-6).

5.5 Picnicking

The estimated need for picnic facilities in the Study region is 800 acres of picnic grounds by 1990 and another 800 by 2020, assuming a density of 25 sites per acre. There is a need to increase the diversity of picnic facilities by providing them for cyclists, canoeists, hikers, touring motorists, and inner city dwellers. The distribution of regional picnic facilities should be expanded to include more sites at natural settings along the shoreline and in natural settings on watershed lands.

5.6 Camping

The estimated need for camp facilities in the Study region is for 700 acres of campgrounds by 1990 and another 900 by 2020, using the present private sector spatial factor of 20 sites per acre. Campgrounds at State parks usually provide primitive facilities at five sites per acre.

The private sector is depended upon to contribute the diversity of more elaborate, motel-like facilities. The States should provide diversity at the other extreme of primitive facilities or hostels for backpacking, canoeing, and bicycling. Local communities could add diversity in terms of group camping facilities for urban residents.

Distribution of camping facilities needs to be enhanced in Connecticut by opening up selected portions of watershed lands to camping, if and as State public health rules permit, and on the eastern end of Long Island by providing all types of camping opportunities.

As with picnicking, the quality of camping experience hinges on adequate operation and maintenance budgets, proper site design to protect the natural setting, and diversity of opportunity in terms of geography and facility.

5.7 Trails

Connective links are needed between existing hiking trails to provide a more complete regional system. Watershed, forest, and agricultural lands need to be fully utilized to lend diversity to the trail system. Urban bike trail systems seem sure to become reality, but cross country bike trails may not. Canoe routes could be enhanced by private sector canoe rental and pickup service. Scenic highways need to be protected from uncontrolled development of viewsheds (P-3).

6.0 TENTATIVE PLANNING OBJECTIVES.

The goal of the Long Island Sound Regional Study is to produce a plan of action by April 1975, which balances the needs to protect, conserve, and wisely develop the Sound and its related shorelands as a major economic and life-enriching resource for the 12 million people who live near it.

This goal can be attained by reflecting society's informed preferences for attainment of two overall, coequal study objectives, as established by the U.S. Water Resources Council (31):

1. Environmental Quality (EQ), which enhances the quality of the environment through the management, conservation, preservation, creation, restoration, or improvement of the quality of certain natural and cultural resources and ecological systems.

2. National Economic Development (NED), which increases the value of the Nation's output of goods and services and improves national economic efficiency.

For this report on Outdoor Recreation, the tentative planning objectives are:

1. To meet the projected need for swimming beaches (reported in Table 6) and improve the quality and access to beach resources in environmentally, economically, and socially acceptable ways.

2. To meet the projected need for wet and dry boat storage and to provide diversity of opportunity and access to the water in environmentally, economically, and socially acceptable ways.

3. To meet the projected need for picnic grounds (reported in Table 6) and improve the distribution and diversity of opportunity in environmentally, economically, and socially acceptable ways.

4. To meet the projected need for campgrounds (reported in Table 6) and improve the distribution and diversity of opportunity in environmentally, economically, and socially acceptable ways.

5. To enhance trail use as part of the open space system.

6. To enhance urban outdoor recreation programs and access to recreation resources.

7. To develop both management and acquisition programs for the development of an integrated and conceptually linked open space system throughout the Study region and to maximize regionally the use and diversity of existing and proposed park and recreation facilities.

To meet these tentative planning objectives, alternatives were formulated and evaluated in terms of environmental, economic, and social well-being criteria. These alternatives were then incorporated where appropriate into a plan of action for the study region. During formulation of the plan of action, three different plans were developed and considered: one emphasizing environmental quality, one emphasizing national economic development, and one reflecting a composite of the two plus some additional social well-being considerations. For the final plan of action, the last of these three was chosen.

7.0 ALTERNATIVES.

The following are generalized alternatives for meeting the outdoor recreation objectives. These are not mutually exclusive ways of meeting the objectives in that no one alternative will totally meet the recreation objectives. A combination of viable alternatives must be implemented in order to maximize recreation opportunities in the Study region.

7.1 Acquisition.

Acquisition of property for park land and private recreation facilities is a major alternative for improving outdoor recreation opportunities. Many alternatives to fee-simple acquisition such as scenic easements or leaseback agreements are being addressed by the Legal and Institutional Work Group (S-4) and are not included in this report.

Characteristics of land and facilities acquired by the public sector for outdoor recreation are the following: the properties are in a natural setting; they sometimes include historic sites, endangered natural areas or cultural settings; and resource oriented recreation facilities; i.e., primitive campgrounds or trails.

Characteristics of land and facilities acquired by the private sector for outdoor recreation are the following: the properties are in close proximity to population concentrations; access to properties, and facilities is controlled and the facilities are the type with high initial investment and rate of return; i.e., marinas, golf courses, tennis clubs, transient camp facilities. Although no site specific acquisition proposals are made for the private sector in this Study, the information about the carrying capacity of the Sound for wet storage of boats and the proposed policy to increase efficient use of boating facilities both apply to the private sector. This Study primarily focuses on recommendations to the public sector for increasing outdoor recreation opportunity in the Study region.

An initial exercise for the Outdoor Recreation Work Group (P-6) was to evaluate the recreation potential of existing open space (23). One hundred and ninety nine (199) sites were initially identified from existing plans, studies, and maps as having outstanding recreation potential. The sites identified ranged in size from 7 acres to 6,380 acres. Altogether they totalled over 30,000 acres. Field checking of the sites revealed approximately 90% did indeed have the designated potential for recreation. However, only 34 sites have been recommended for acquisition as park land. The majority have recreation potential and should be incorporated in an open space system for the Study region through some means other than fee-simple acquisition.

Many extensive-use recreation activities such as hiking, nature study, hunting, and fishing are compatible with other open space uses such as scenery (P-3), watershed protection (P-2), flood protection (P-5), and protection from erosion and sedimentation (P-4).

7.2 Redevelopment.

According to a study conducted for the Shoreline Appearance Work Group (P-3), only 26 miles of the 200 mile shoreline of Long Island Sound is presently free from some type of structural development. Thus, there is little opportunity for acquisition of vacant shorefront property for recreation. Shorefront property will always be prime real estate and continually subject to development and redevelopment pressures. As property tax rates increase, the pressure to more fully utilize vacant or underutilized shorefront property will accelerate. The resulting redevelopment cycle provides significant opportunity for outdoor recreation. Four types of redevelopment which present recreation opportunities include: urban renewal, flood control, development of artificial islands or peninsulas, and regulation of private redevelopment.

7.2.1 Urban Renewal. Many plans and actions are in process for urban renewal of the major harbors in the Study region. As these harbors are rejuvenated, special attention should be given to providing access to and from recreation facilities at the shorefront. One of the strongest themes in today's outdoor recreation planning is to bring the "parks to the people." Urban renewal of the major harbors in the Study region represents a great opportunity to do just that. Urban renewal of harbors would particularly benefit residents of New London, New Haven, Bridgeport, Norwalk, North Hempstead, and Port Jefferson. These areas would be particularly suited for scenic viewpoints, boating access, fishing piers, and picnic sites. A broad analysis of urban renewal and land use is pursued by the Land Use and Shoreline Appearance and Design Work Groups (P-1, P-3).

7.2.2 Flood Control. The Flood Damage Reduction Work Group (P-5) has proposed several structural measures for flood control which could accomplish recreation goals as well. Dikes and walls could provide recreation access to the shorefront for scenic viewpoints, fishing sites, picnic sites, and in limited cases, boat launch lanes.

Another alternative of the P-5 Work Group is relocation of buildings from the flood plains. This relocation alternative, whether prior to or following a natural disaster, is felt to be a very significant one for meeting shorefront recreation needs. The Outdoor Recreation Work Group (P-6) has identified 21 miles of shorefront with substantial recreation potential which is prime for redevelopment (see Appendix D). Much of the cited shoreline has good quality beach and is occupied by small cottages that are 25 to 50 years old and have assorted problems such as inadequate septic tanks and deteriorated foundations and structures.

7.2.3 Development of Artificial Islands Or Peninsulas. The development of artificial islands or peninsulas appears to have economic appeal in that it is cheaper to create land on a per acre basis than to acquire shorefront property. Environmental effects could be very detrimental, and this possibility is being considered at this writing. No site specific proposals have been made at this time. If any site specific proposals are confirmed, they will be included in the main report.

7.2.4 Regulation of Shorefront Redevelopment. The main report includes a recommendation for regulation of shorefront development or redevelopment within a 500 foot zone. Acceptance of this proposal would tend to protect and enhance recreation resources at the shoreline.

7.3 Multiple Use.

The concept of multiple use, the use of public and quasi-public properties for additional purposes, is growing in importance as the supply of open space dwindles and the demand for recreation increases. The greatest potential for multiple use is often times in urban areas where unsatisfied needs for recreation opportunity are greatest.

The nature of multiple use opportunities varies as much as the use of public and quasi-public property. Recreation experiences range from a hiking trail in a wilderness-like setting on State forest land to a small playground on the rooftop of a building. Table 7 shows the nature of recreation experiences which are compatible with various multiple use opportunities (25). Specific multiple use opportunities are presented in Appendix D1.

The concept of multiple use could be most productively employed in planning future facilities and publicly-regulated utilities. Existing public facilities have only limited potential for recreation which could have been much greater if multiple use was initially incorporated in the site design. All public facilities proposed by the Water Management Work Group (P-2) and the Electric Power and the Environment Work Group (P-10) should include provisions for outdoor recreation access and facilities.

TABLE 7. NATURE OF MULTIPLE USE OPPORTUNITIES

Source: (25)

Recreation Opportunities	Compatible Recreation Activities							
	Swim	Boat	Picnic	Camp	Hiking Walking	Games Sports	Fish	Hunt
Water Supply Res.[1]	X	X	X	X	X		X	X
Upper Reaches of Water Supply Lands			X	X	X		X	X
Flood Control Res.	X	X	X	X			X	X
Forest Lands			X	X	X			X
Agricultural Lands			X	X	X			
Borrow Pits & Quarries	X	X					X	
Institutional Lands			X			X	X	
Cemeteries, Memorial Parks			X		X			
Airport Lands						X	X	
Military Lands	X	X	X		X			
Wildlife Mgmt Areas					X		X	X
Power Plants	X	X	X				X	X
Sewage Treatment Plants		X				X		
"Play" Streets						X		
Roof Tops						X		
Parking Lots						X		
Utility Co. Rights-of-Way			X		X			
Highway Rights-of-Way			X		X	X		

[1] Where water is treated before distribution.

Much of the open space in the Connecticut portion of the Study region consists of land set aside for watershed protection and forests. These lands could be more fully utilized for recreation activities which are compatible with forest and watershed interests.

Linear types of multiple use, such as utility or highway rights-of-way are particularly useful in an urban environment for trail development. Rights-of-way for sewer and transmission lines can provide safe corridors to bring the people to the parks.

Where possible, sewer routes proposed by the Water Management Work Group (P-2) and transmission line paths proposed by the Electric Power and the Environment Work Group (P-10) should include a trail system for recreation. The transportation departments of New York and Connecticut should also consider a recreation trail system in their highway programs.

7.4 Accessibility.

Accessibility of recreation resources is a key issue in the Long Island Sound Regional Study. According to the New York SCORP, access to facilities is one of the major factors affecting the rate of participation in many outdoor recreation activities. Coastal recreation resources are limited and in great demand. Adequate access must be provided in order to ensure their maximum utilization. The variety of recreation experience available is directly correlated to the degree of access to the recreational resources.

Transportation corridors bring the people to the parks and the mode of transportation most commonly utilized effects the design of the park itself. The larger the parking area for vehicles, the smaller the area to play. The size of parking areas dictates the use capacity of many parks adjacent to the Sound. Beaches are often closed when the parking lot is full, not when the recreation facilities are crowded or the ecological quality is degraded. In almost every case, the recreation properties in the Study region could accommodate increased capacity by limiting automobile access and providing instead an alternative mode of mass transportation to the park. Such an alternative must be convenient and economical if it is to be patronized by the recreators.

The two-fold benefits that could be derived from more emphasis on mass transit are: better access where there is limited parking space at recreation areas, and an improved quality of environment.

The effect of restricting the use of park land, particularly beaches, in the Study region is two-fold. Use restrictions reduce the resource options open to the recreator and place more burden on nearby parks with no use restrictions.

As population density increases, so does the need for recreation facilities, and so does the trend toward use restrictions. As the population becomes more mobile, viable alternative recreation resources are more likely to be utilized. Use restriction impairs efficient use of existing recreation resources during off-peak use periods.

The major factor contributing to the low percentage of days that beaches are heavily used is the relatively standard five day work week. The vast majority of people in the Study region have the same two days per week to recreate. The weekend crunch is a burden to the transportation corridors in the Study region and places extreme pressure on the park system.

A staggered work week could encroach on many religious groups and the business community and thus may never be universally accepted, but such a change in our current lifestyle is a very important element to achieving maximum utilization of park lands. An equal percentage of the work force should be free to enjoy the park system every day of the week. The adoption of a four-day work week would greatly expand our opportunity to participate in a broad range of outdoor recreation activities. A three-day weekend also allows more time to shift emotional gears, relax, and become more pychologically attuned to a recreation experience.

If every public park facility in the Study region which now has use restrictions would limit use restrictions only to weekends and holidays in the summer season, the utilization of existing recreation resources would be greatly enhanced.

A standard park entrance sign could be adopted to explain the time zoning of each park for residents and non-residents. The time zones would be determined separately for each park depending on its particular use patterns.

In this way, people living throughout the Study region, as well as visitors, would understand which few days during the year access to the parks would be restricted. Families could plan their recreation activities at parks for off peak periods.

This approach might alleviate the growing pressure to open all parks in the Study region to everyone. Until park managers have sufficient maintenance crews and budgets to repair vandalized facilities, sufficient police protection to effectively protect property, and lifeguards and nurses to protect the people, parks cannot realistically be open on peak days to ever-increasing numbers of people. And there will always be an upper limit on the number of people who can be accommodated at one time at any park, without degrading the environment.

For parks in the Study region where parking space for automobiles is a problem and mass transit is unlikely to be acceptable, there are two alternatives to increase access. One is to build a parking garage at the park in order to stack automobiles on top of each other. A second alternative is to utilize nearby existing parking lots at shopping and industrial centers on the weekends and provide transportation from the parking lots to the park itself.

7.5 Efficient Use.

Efficient use of recreation property is a vitally important consideration when evaluating the recreation resources of the Long Island Sound Study Region. A plan to improve recreation opportunity should include both an acquisition program to obtain new properties and an expanded development, operation, and maintenance program at existing properties. Recreation planners and managers must not only look to acquiring real estate for tomorrow, but also focus on developing a quality experience in a variety of existing recreation opportunities for today.

For this report, efficient use of recreation property will refer to the opportunity to expand recreation facilities and programs at parks in the Study region without degrading the environment. At present, the prime motivation for visiting all the State parks bordering the Sound, with the possible exception of Wildwood State Park, is to swim at the beach. These parks could be transformed into year-round facilities which could be utilized by local people as well as out-of-towners by providing facilities and programs such as heated swimming pools, fishing piers, nature centers, community meeting rooms, ice skating rinks, hunting seasons, boat ramps, and docks for transient boaters. The effect would be more visits to the park by more kinds of people year round. The taxpayer would be getting more for his tax dollar than just a swimming beach.

TABLE 8

REGIONAL BEACH RESOURCES WITHIN A FOUR HOUR DRIVE FROM NEW YORK CITY

Source (27)

	Miles of Guarded Beach at Major Facilities	Width of Beach	Beach Materials	Surf Exposure	Transportation Access	Patrons/ Season	Population Center
LISS (including Misquamicut)	8.4	narrow	variable	sheltered	public & highway	15,022,000	Conn., LI, NYC
Cape Cod	20.2	wide	sand	exposed	local roads	12,670,000	Boston Nationwide
Buzzards Bay	4.6	medium	sand	partially exposed	local roads	971,520	Boston, New Bedford, Providence
Narragansett Bay	16.5	narrow	mud variable	sheltered	local roads	6,969,600	Providence
Rhode Island Coast (excluding Misquamicut)	9	medium wide	sand	partially exposed	local roads	5,702,400	Providence Conn.
South Shore Long Island	22.5	wide	sand	exposed	some p.t. highway	37,456,000	New York, L.I.
Gateway National Recreation Area	12	medium wide	sand	sheltered exposed	public & highway	12,000,000	NJ, NYC Harbor
North Jersey*	28	medium wide	sand	exposed	highway	17,740,800	NJ, NYC
South Jersey*	53	wide	sand	exposed	highway	33,580,800	Phila.

*Assumes that 75% of public beach is guarded.

Width of Beach (prevailing width of region)

narrow - less than 100 ft.
medium - 100-300 ft.
wide - 300 ft.

Surf - exposure to ocean swells and wave action

Transportation Access

public - rapid transit and public trans. service
local rds.- more than ten miles of local roads from highway
highway - 4 lane limited access road within 10 miles

The States can lead in providing well distributed and more diverse programs and activities at their parks. This is a very costly undertaking and, therefore, will most likely be implemented for State recreation programs.

More efficient use of shorefront for beaches could be achieved by providing lifeguard service for a longer portion of the shorefront and extending the time period of guarding by season and day. Beach capacities could be increased by beach nourishment to widen sandy areas.

Efficient use of marina facilities is particularly important if the demand for the boating facilities is to be met. Dry land storage of boats, boat rentals, and weekend slip rentals should be encouraged in the private sector.

7.6 Alternatives to Shoreline Recreation.

This report recognizes that not all of the demand for swimming, boating, picnicking, and camping along the shoreline of the Sound can be or should be met along the Sound. There are alternative sites within one day or two days' travel time from the Study region which provide facilities for all these activities. For example, Table 8 shows the location, accessibility, and quality of major salt-water beaches within a four hour drive from New York City. Long Island Sound beaches have regional significance comparable to New Jersey, Rhode Island, the south shore of Long Island, and the Gateway National Recreation Area.

In calculating the demand for recreation in each Study subregion and the ability of each subregion to meet its own demand, it was clear that the most densely populated subregions were least able to provide new sites for recreation; therefore, the recreation demands of their respective populations would have to be satisfied in the less densely populated subregions, at the shoreline and inland, or outside of the Study area entirely. The manner in which recreation demand was distributed is discussed in Appendix B on pages B-2 and B-4.

7.7 Private Incentives.

Steps must be taken to encourage private investment in recreation facilities and programs if the recreation potential in the Study region is to be fully realized.

Public policy to aid the private sector will focus on problems of excessive property tax, liabilities, insurance, and technical assistance in management and financing.

8.0 EVALUATION OF ALTERNATIVE MEASURES.

The generalized alternatives presented in Section 6 are evaluated in this section according to how they relate to the planning objectives presented in Section 5. Appendix E contains, in table form, an evaluation of each alternative as measured by environmental, economic, and social criteria. The method of evaluating the criteria is an adaptation by the LISS management of guidelines to evaluate planning alternatives prepared by the U.S. Water Resources Council. Judgments as shown in the evaluation matrix reflect overriding, long-term, and most probable impacts of implementing a specific alternative. Footnotes to Appendix E describe terms, and in some cases, explain the basis for the evaluation.

In this section, the highlights of the evaluation are presented; first the major environmental, economic, and social premises on which the evaluations were based and then, each alternative as a means of satisfying the various objectives. A summary table of the evaluation matrix in Appendix E is presented for each objective.

8.1 Major Environmental Considerations

With proper design, operation, and maintenance, recreation facilities and programs can be environmentally compatible and often more desirable than other land and water use alternatives. In developing the recommended plan of action, effort was made to strike a balance between developed recreation property and preservation of natural areas and open space. This is reflected in the open space plan described in the main report.

Recreational boating has the greatest potential for environmental degradation. Congestion and water pollution in harbors, coves, and inlets due to boating traffic, storage, and overnight transient use can lower the quality of water, the scenic impact, and the boating experience itself. In response to this potential, estimates were made of carrying capacities for wet storage and handling of boats in major harbors, coves, inlets, and rivers in the Study region. These carrying capacities, shown in Appendix D, were derived from environmental, physical, and social concerns.

8.2 Major Economic Considerations

Economic considerations played a major role in differentiating the type of recreation opportunity that should be provided by the public sector as opposed to the private sector. Recreation opportunity that is recommended for public sector responsibility is meant to complement rather than compete with the private sector and includes activities with operation and maintenance constraints such as seasonality of the activity, higher property taxes, high insurance risks, and opportunities which traditionally have been a lower economic return on the investment. Examples of recreation opportunity that is recommended to be provided by the public sector include regional public beaches, public marina facilities specializing in boat ramps and hoists, slips, boat rentals, and boating skill instruction; primitive camping facilities in natural settings accessible to automobile, canoe, bicycles, and/or foot; and regional picnic facilities on multiple use property with highly scenic settings.

It is recommended that the private sector provide recreation opportunities that are economically profitable based on the willingness to pay by the customer, restricted use facilities, extended season of activity, presence of supplementary income producing enterprise, and those opportunities traditionally provided by the private sector. Examples of recreation opportunity that is recommended to be provided by the private sector include marina facilities such as slips, moorings, freshwater and electricity dockside, marine supplies, engine and hull repairs, and gasoline, boat, motor, and trailer sales; charter boats; golf courses; enclosed tennis courts; ice and roller skating rinks; snow ski facilities; swimming clubs; small ferries; and developed campgrounds.

The private sector must be encouraged to expand the quantity, quality, and diversity of recreation opportunity provided if the potential of the recreation resources of the Study region are to be fully utilized.

8.3 Major Social Considerations

Expanding outdoor recreation opportunity is one of the major social considerations of the Study. Outdoor recreation and associated amenities are a function of the quality of life and are key elements of the attraction the Sound holds for the people whose concern brought about this Study.

The thrust of the social considerations in the recommended plan of action is to expand the quantity, quality, distribution, and diversity of outdoor recreation in the Study region. This theme is the prime rationale behind the planning objectives set forth in Section 6 and the discussion that follows regarding alternatives and recommendations.

8.4 The Alternatives as they Relate to Objectives

The generalized alternatives presented in Section 7 which are to increase outdoor recreation opportunity in terms of quantity, quality, distribution, and diversity are now related in this section to specific Study objectives. From the list of specific alternative measures developed for each objective, the ones felt to be most significant and in concert with the scope of this Level B Water Resources Council Study are evaluated using the matrix methodology developed by the LISS management staff.

8.4.1 Beach Swimming. To meet the objectives for beach swimming, six of the seven broad alternatives discussed previously apply: (1) acquisition; (2) redevelopment; (3) multiple use; (4) accessibility; and (5) efficient use. The sixth, "alternatives to shoreline" is incorporated in the magnitude of the projected need.

Within these broad alternatives, there are a number of specific alternatives listed in Table 9 which relate ways for the public sector to meet the beach swimming needs. Measures 1, 2, and 5 may be implemented through specific projects or programs listed and summarized by subregion in Appendix D. The third is a potential for the future, and the fourth is a policy measure applicable to publicly owned beaches.

The three types of acquisition of vacant land listed in Table 9 meet three different types of beach swimming needs and thus add diversity, distribution, and quantity of opportunities for beach swimming. Long Island Sound shoreline acquisition would serve the conventional need for swimming beaches. River and lakeshore acquisition for beaches provides a freshwater experience inland and tends to meet a localized need. Island shoreline reserved for swimming is utilized by boaters and enhances diversity and quality of the boating experience. For simplicity, this alternative will not be broken down into its three parts when applied to the evaluation matrix.

The redevelopment alternative applied to beach swimming refers specifically to creating new beaches via urban renewal, relocating buildings off the flood plain, regulating shorefront land use as is proposed in the Land Use Planning Report (P-1) and the main report, and constructing artificial islands.

All specific proposals for new and expanded beach facilities shown in Appendix D have regional significance. Proposals for new or expanded beach facilities in urban areas always involve relocation from the flood plain. Five of the 23 beaches identified as having recreation potential for redevelopment of the flood plain are recommended by specific proposals of acquisition prior to a natural disaster. The remaining 18 listed beaches shown in Appendix D2 are recommended for redevelopment after a natural disaster.

Regulation of the shorefront land use to enhance beach swimming opportunity and other shorefront land uses is not further discussed here, but you are referred to the Land Use Planning Report (P-1) and main report.

Artificial islands for recreational use as an alternative means of meeting swimming needs have been proposed for the Study region, and a specific proposal appears in the main report of the Long Island Sound Study under "Recreation."

Multiple use of reservoirs for beach swimming is listed here but does not appear to have major significance in meeting projected need in the foreseeable future. Therefore, it is not included in the matrix analysis.

A variety of policies are listed for the accessibility alternative. These policies do not lead to physically adding more shorefront devoted to beaches, but are meant to enhance the efficient use of existing public beach facilities. The policies to alter the work week and open public beaches with use restrictions to all during off peak periods are considered to be the policy proposals with the most significant impact and, therefore, are included in the matrix analysis.

For beach swimming, the efficient use alternative relates to developing all suitable park shorefront for beach swimming, increasing the depth of the beaches via beach nourishment, and maximizing safety coverage of the beach during the swimming season. Beach nourishment has by far the most potential for increasing opportunity and is discussed in the Erosion and Sedimentation Planning Report (P-4). Table 4 on page 28 of the March, 1974, draft of that report cites 72 beaches totaling 60.5 miles as having potential for beach building or beach widening improvements. If the rule of thumb is applied that the average increase in depth of the beaches is 100 feet, the capacity of the beaches might be increased one half or be equivalent to adding 30 miles of guarded beach on the Sound. This would theoretically meet all the projected quantitative need for beaches without utilizing more shorefront. However, there are two major environmental constraints to this

TABLE 9. ALTERNATIVE MEASURES TO MEET BEACH SWIMMING NEEDS

1. PUBLIC SECTOR ACQUISITION OF VACANT LAND
   - a. Long Island Sound shoreline
   - b. Island shoreline
   - c. Inland Lake and river shoreline

2. REDEVELOPMENT
   - a. Urban renewal-create new beaches
   - b. Relocation from tidal flood plain
     - (1) Acquisition prior to natural disaster
     - (2) Acquisition following natural disaster - land bank via State and local contingency fund
   - c. Development of artificial islands or peninsulas
   - d. Regulation of redevelopment in 500-foot shorefront zone

3. MULTIPLE USE
   - a. Water supply reservoirs where water is properly treated
   - b. Flood control reservoirs

4. ACCESSIBILITY
   - a. Open public beaches with use restrictions to all during off peak periods
   - b. Improve automobile access to beaches
     - (1) Improve highway system to regional beaches not now serviced by four lane highways
     - (2) Construct multi-tier parking lots at regional beaches
     - (3) Utilize industrial and commercial parking lots on days unoccupied for access to beaches
   - c. Improve mass transit service to beaches
     - (1) Coordinate rail, bus, and ferry scheduling for prime leisure time periods
     - (2) Accommodate bicycles on mass transit vehicles
   - d. Designate bike trails from urban cores to beaches
   - e. Alteration of work week

5. EFFICIENT USE
   - a. Develop all suitable portions of park shorefront for beach swimming
   - b. Increase depth of beach sand via beach nourishment
   - c. Extend safety coverage of beaches
     - (1) Guard more linear feet of shoreline
     - (2) Guard beach for longer period of time during day
     - (3) Guard beach for longer season

TABLE 10. SUMMARY EVALUATION OF ALTERNATIVE BEACH SWIMMING MEASURES

	Environmental Quality (EQ)	National Economic (NED) & Regional Development (RD)	Social Well-Being (SW)
Acquisition of vacant land	Fair	Good	Good
Relocation from flood plain			
Prior to natural disaster	Good	Good	Good
Following natural disaster	Good	Good	Good
Development of artificial islands	Poor	Fair	Fair
Open beaches to all during week	Fair	Fair	Good
Alteration of work week	Good	Fair	Good
Improve auto access	Poor	Fair	Good
Coordinate public transit schedules	Fair	Fair	Good
Improvements to existing beaches			
Expand safety coverage	Fair	Fair	Good
Beach nourishment	Poor	Fair	Fair

alternative. First, beach nourishment requires an environmental impact statement on a case by case basis, since the effects of additional sand on currents and marine bottom life vary with the location of the beach. Second, there may be difficulty in obtaining an adequate source of sand. The major social constraint is that by increasing the depth of the beachfront, the capacity of the beach is expanded, but the quality of the experience may be construed to decrease. Refer to the Erosion and Sedimentation Planning Report (P-4) for their matrix analysis of this alternative and any site specific proposals.

Table 10 is a summary of the evaluation matrix shown in Appendix E of the major alternatives to meeting the beach swim objective.

8.4.2 Boating. To meet the objective for boating, all the broad alternatives discussed previously apply: (1) acquisition; (2) redevelopment; (3) multiple use; (4) accessibility; (5) efficient use; and (6) private incentive. The seventh "alternative to shoreline," is incorporated in the magnitude of the projected need.

Within these broad alternatives, there are a number of specific alternatives listed in Table 11 which relate ways to meet the boating needs. Measures 1, 2, 3, and 5 may be implemented through specific projects or programs listed and summarized by subregion in Appendix D. The fourth and seventh alternatives are policy measures applicable almost anywhere.

TABLE 11. ALTERNATIVE MEASURES TO MEET BOATING NEEDS

1. ACQUISITION
   a. Private Sector
      (1) Water surface for slips
      (2) Land for dry land storage
      (3) Land backup for parking, service facilities
   b. Public sector
      (1) Islands for transient use
      (2) Shoreline for public marinas
         (a) Small boat rentals
         (b) Boat ramps and hoists
         (c) Boating skills instruction
         (d) Small-boat slips
      (3) Lakes for day use - small craft
      (4) Boat launch lanes

2. REDEVELOPMENT
   a. Urban renewal - public marinas
   b. Flood control structural measures - boat ramps
   c. Relocation from flood plain - boat ramps
      (1) Prior to natural disaster
      (2) Following natural disaster - land bank via State and local contingency fund
   d. Regulate redevelopment in shorefront 500 foot zone
      (1) Provide Statewide zoning for marina development
      (2) Give local communities or State right of first refusal for marina facilities up for sale

3. MULTIPLE USE
   a. Adopt existing facilities for boat launch lanes
      (1) Power plants
      (2) Sewage treatment plants
      (3) Oil tank farms
      (4) Institutional land
      (5) Country clubs
      (6) Cemeteries
      (7) Military lands
      (8) Mined lands
      (9) State game lands
   b. Design future public facilities to include outdoor recreation opportunities

4. ACCESSIBILITY
   a. Provide public transportation to public marinas and major dry storage facilities
   b. Alteration of work week

TABLE 11. ALTERNATIVE MEASURES TO MEET BOATING NEEDS

(CONTINUED)

- c. Clear protected water for boating traffic
    - (1) Decrease the number of mooring permits in congested harbors
    - (2) Expand dry land storage facilities by the private sector
- d. Maximize activity day use of boats
    - (1) Public sector should provide boat rentals
    - (2) Private sector should give slip rental priorities to frequently used craft
    - (3) Float plans should be left with marina operator so vacant slip could be utilized by the transient boater

5. EFFICIENT USE
    - a. Boat launch lanes should be upgraded to accommodate boat trailers at low tide
    - b. Boat launch lanes and transient dock facilities should be provided at regional parks on the Sound

6. PRIVATE INCENTIVE
    - a. Property tax allowance provided for the private marina operator
    - b. Sales tax or insurance allowance provided to encourage multiple ownership of boats

The acquisition of vacant land and redevelopment alternatives are very closely tied, particularly for boating. Acquisition of vacant land for boating facilities contributed by the public sector relates to recreational use of undeveloped islands. Some types of redevelopment is invariably necessary for public marina projects. Development of recreational boating facilities by the private sector may involve redevelopment of the shoreline, depending on the circumstance. For purposes of this discussion, site specific proposals will only be made for these two alternatives as they relate to the public sector. Therefore, a matrix analysis is conducted only for public marina proposals. Private sector development of boat handling and storage facilities is articulated only to the degree of estimating the capacity of the Study region for wet and dry boat storage and launch lanes.

A key policy issue incorporated in the development of boat handling and storage facilities is the economic and physical efficiency of the facilities and the type of use served. In order to enhance the quantity, diversity, and distribution of the boating experience, it is recommended that facilities be provided for boat storage both at the shoreline and at home, and not be considered as alternatives to one another. The three basic types of boat storage, i.e., trailer, dry storage at the shoreline, and wet storage, tend to provide for different types of boating activity. Boat launching devices provide access to a variety of water, convenience of access for small fishing craft and broad distribution of opportunities. Wet storage via slips or moorings provides a kind of "home port" opportunity for boats and large cruisers. Dry land storage can provide efficient handling of craft up to 25 feet without taking up protected water surface as a storage area. Planning recommendations encourage all three types of facilities up to the limits of the carrying capacity of the Study region as depicted in Appendix D2.

The redevelopment alternative of relocation from the flood plain can, in most cases, accommodate boat launching facilities in concert with the beach proposals. This would particularly enhance the distribution of boating access points.

Multiple use of public and quasi-public facilities located on the shoreline is particularly adaptable to boat launch lanes. Providing boat launching devices where feasible at existing and future public facilities would help meet a major boating need in the Study region for a larger quantity and greater distribution of small craft access points. Multiple use proposals for boat launch devices in the Study region presented in Appendix D1 are meant to demonstrate the magnitude of the need that could be practically met by implementing this policy on existing facilities. Opportunities for incorporating 40 boat launch lanes at 19 locations around the Sound were identified. The more significant policy is to incorporate these recreation facilities into future public utility development.

The accessibility alternative relates to boating both in terms of transportation of recreators to boat handling and storage facilities and in boating traffic on the water generated in pursuit of the activity. Limited space for automobile parking can be a limiting factor for boat handling and storage facilities, so policy alternatives are listed similar to those for beach swimming to enhance access to public marinas and large volume dry storage facilities.

Boating opportunities are being shut off by unused boats occupying water surface which is important to boating traffic. Protected water is very limited on the Sound and should be utilized for waterskiing, sailing and fishing, and not just as a parking lot. Policy proposals listed under the accessibility and private incentive alternatives are designed to encourage that slips and moorings be utilized to serve a maximum number of boating activity days, unoccupied slips and moorings be made available for transient use, and where possible, water surface be utilized for boating activity over boat storage.

The efficient use alternative refers to enhancing the quantity, diversity, and distribution of the boating experience by incorporating boat launch lanes and transient boating facilities at regional parks on the Sound.

The private incentive alternatives are aimed at bolstering the economy of the marina industry and encouraging maximum utilization of privately owned crafts.

A matrix analysis was used for specific proposals for the public sector and policy proposals for the private sector. Table 12 is a summary of the evaluation matrix shown in Appendix E of alternatives to meeting the boating objective.

TABLE 12. SUMMARY EVALUATION OF ALTERNATIVE BOATING MEASURES

	Environmental Quality (EQ)	National Economic (NED) & Regional Development (RD)	Social Well-Being (SW)
Public marina development as described	Fair	Good	Good
Boat access in conjunction with relocation from flood plain for beaches	Good	Fair	Good
Multiple use for boat access	Fair	Good	Good
Alteration of work week	Good	Fair	Good
Clear protected water for boating traffic	Good	Fair	Good
Maximize activity day use of boats	Good	Good	Good
Property tax allowance to marinas	Fair	Fair	Good

8.4.3 Picnicking. To meet the objective for picnicking, five of the seven broad alternatives apply: (1) acquisition; (2) redevelopment; (3) multiple use; (4) accessibility; and (5) efficient use.

Within these broad alternatives, there are a number of specific alternative measures listed in Table 13. Measures 1, 2, 3, and 5 may be implemented by specific projects or programs listed and summarized by subregion in Appendix D1. The fourth alternative is a policy measure applicable to public parks.

TABLE 13. ALTERNATIVE MEASURES TO MEET PICNIC NEEDS

1. ACQUISITION - Public Sector
   a. Inland
   b. Shoreline
   c. Islands

2. REDEVELOPMENT
   a. Urban Renewal
   b. Relocation from flood plain
   c. Development of artificial islands or peninsulas

3. MULTIPLE USE
   a. Watershed lands
   b. Forest lands

4. ACCESSIBILITY
   a. Open parks with use restrictions to all during off peak periods

5. EFFICIENT USE
   a. Expand picnic facilities at existing parks

All acquisition alternative proposals deal with the public sector and in particular, major State parks and regional park proposals. Smaller picnic facilities closer to urban centers are also of concern, but site specific proposals in the major urban centers are generally beyond the scope of this Study.

Every shoreline redevelopment site has potential for picnicking. Major picnic sites in view of the seascape are in short supply in the Study region (P 3).

Multiple use of watershed lands in Connecticut offers a major potential for increasing the quantity, quality, diversity, and distribution of picnic opportunity.

Opening public parks with use restrictions during off-peak periods would be particularly useful within the 20 to 50 year planning horizons since future predictions include more leisure time and mobility. The demand for picnic facilities in the future will tend to be less cyclic to weekend days than other activities; i.e., more picnics more times during the week.

A matrix analysis was used for specific proposals and policies for the public sector. Table 14 is a summary of the evaluation matrix shown in Appendix E of alternatives to meeting the picnicking objective.

TABLE 14. SUMMARY EVALUATION OF ALTERNATIVE PICNIC MEASURES

	Environmental Quality (EQ)	National Economic (NED) & Regional Development (RD)	Social Well-Being (SW)
Public acquisition/ development	Good	Good	Good
Picnic facility in conjunction with relocation from flood plain for beaches	Good	Fair	Good
Multiple use of watershed lands	Good	Good	Good
Open parks to all during week	Good	Fair	Good
Development of existing parks	Good	Good	Good

8.4.4 Camping. To meet the objective for camping, five of the seven broad alternatives apply: (1) acquisition; (2) multiple use; (3) efficient use; and (4) private incentive. The fifth, "alternative to shoreline," is incorporated in the magnitude of need. Within these broad alternatives, there are a number of specific alternative measures listed in Table 15. Measures 1, 2, and 3 may be implemented by specific projects and programs listed in Appendix D1. The fourth alternative is a policy measure applicable almost anywhere.

The public sector acquisition alternative focuses on camping experiences in a natural setting with a minimum amount of facility development. Island acquisition for camping would greatly enhance boating experiences on rivers in the Study region as well as on the Sound. For group camping, the setting is not as important, but more group sites with better access are needed.

Campsites in private campgrounds are usually set at 20 sites per acre as opposed to five sites per acre at State parks. The private sector also provides more complete facilities such as individual power, water and sewer hookups. They are particularly in demand at regional beaches in the eastern end of the Study region where demand exceeds supply.

TABLE 15. ALTERNATIVE MEASURES TO MEET CAMPING NEEDS

1. ACQUISITION
   a. Public sector
      (1) Inland - natural setting and primitive facilities
         (a) Auto access
         (b) Trail access
      (2) Islands - primitive facilities
      (3) Group camp facilities near urban areas
   b. Private sector - full range of facilities
      (1) Transient - along highways
      (2) Destination - near State parks, beaches, and tourist attractions

2. MULTIPLE USE - Primitive Facilities - Trail and/or Auto Access
   a. Water lands
   b. Forest lands

3. EFFICIENT USE - Expand Camp Facilities at Parks

4. PRIVATE INCENTIVE
   a. Tax incentive for use of agricultural lands
   b. Property tax incentive to private entrepreneur

The multiple use alternative presents the most significant opportunity for camping in the Connecticut portion of the Study region. Primitive camping is a use compatible with both forest and watershed interests.

If the Study region is to ever become camping facility rich instead of camping facility poor, the private incentive alternatives will most likely have to be implemented. Agricultural lands are interlaced with woodlands which are very suitable for campground development. Because of the seasonality characteristics of camping, the low fee per site and high property tax, the private entrepreneur needs financial and technical assistance in order to establish and operate a profitable enterprise.

Table 16 is a summary of the evaluation matrix, shown in Appendix E, of camping alternatives.

TABLE 16. SUMMARY EVALUATION OF ALTERNATIVE CAMPING MEASURES

	Environmental Quality (EQ)	National Economic (NED) & Regional Development (RD)	Social Well-Being (SW)
Public acquisition/ development	Good	Good	Good
Multiple use of watershed lands	Fair	Good	Fair
Multiple use of forest lands	Fair	Good	Fair
Development of existing parks	Fair	Good	Fair
Tax allowance for use of agricultural land	Fair	Fair	Fair
Property tax allowance to private entrepreneur	Fair	Fair	Fair

8.4.5 Objectives Relating to LISS Open Space Plan. For simplicity and clarity, recommendations relating to the regional, urban, and trails planning objectives as listed in Section 6 are all combined in this one section. Discussion here is meant to relate to the open space plan labeled the "Long Island Sound Heritage" in the main report. Recommendations offered in this section are not necessarily alternatives to each other in meeting stated objectives.

Policy recommendations for the open space plan relating to outdoor recreation are listed in Table 17. The proposals listed in Appendix D1 for State and local acquisition of park land are considered to be key parcels of the open space system. Use of the existing park system and proposed additions could be enhanced by the development of a leisure transportation system.

An effective leisure transportation system would be as complex and diversified in nature as the proposed open space system itself.

It is proposed that the public sector provide bike trails and key parcels along trails; i.e., picnic sites, campsites, and access points, to enhance a comprehensive trail system for the Study region.

Legislation is suggested to alleviate liability of the property owner for permitting public access across his land and to compensate the land owners via property tax allowances for permitting public access across private land.

A ferry system from urban centers to major islands and parks is a key to maximizing use of recreation resources. This action is considered to be appropriate for either the public or private sector.

TABLE 17. ALTERNATIVE MEASURES FOR OPEN SPACE SYSTEM

1. PUBLIC SECTOR ACQUISITION OF VACANT LAND
    - a. Designated parcels
        - (1) State
        - (2) local
    - b. Vest pocket parcels for trail systems
        - (1) hike
        - (2) bike
        - (3) canoe

2. REGULATE LAND USE

3. DEVELOP LEISURE TRANSPORTATION SYSTEM
    - a. Trails
        - (1) bike trails via Federal highway funds
            - (a) intercity
            - (b) intracity
        - (2) amendment to Connecticut recreation liability law to include access across private land
        - (3) property tax allowance for trail access on private land
    - b. Ferry system on Sound via private or public sector
    - c. Coordination of public transportation scheduling during leisure time periods

4. EXPAND AND DIVERSIFY URBAN RECREATION PROGRAMS

5. RIGHT OF FIRST REFUSAL TO PUBLIC SECTOR FOR PRIVATE RECREATION PROPERTY UP FOR SALE

Public transportation systems should have coordinated scheduling during leisure time periods. If the proposed open space system is to truly serve the urban centers around the "urban sea," then the urban population must not only be mobile, but also be adept at recreation activities relevant to open space. Urban residents should be introduced via urban recreation programs to the nature and scope of recreation activity which is compatible with the open space system.

Land use regulation is a necessary tool to manage the open space system, and discussion is deferred to the main report and the Land Use Planning Report.

Table 18 is a summary of the evaluation, shown in Appendix E, of open space alternatives.

TABLE 18. SUMMARY EVALUATION OF ALTERNATIVE MEASURES RELATING TO OPEN SPACE

	Environmental Quality (EQ)	National Economic (NED) & Regional Development (RD)	Social Well-Being (SW)
Public acquisition/ development	Good	Good	Good
Regulation of land use	Good	Fair	Fair
Leisure transportation system			
Trails	Good	Fair	Good
Public Transportation	Good	Fair	Good
Expansion and diversity of urban recreation programs	Good	Fair	Good
Right of First Refusal	Good	Fair	Good

9.0 FORMULATION AND EVALUATION OF ALTERNATIVE PLANS

The alternatives relating to planning objectives as they appear in Tables 10, 12, 14, 16 and 18 of Section 8 were combined and refined during LISS plan formulation meetings, held in April and May, 1974. The resulting list of alternatives is presented here in Table 19 in order to provide a framework for an overall composite recreation plan. The eight planning objectives presented in Section 6 may also be combined as follows:

> The overriding objective of the plan of action is to maximize recreation opportunity in terms of quantity, quality, diversity, and distribution with special emphasis on beach swimming, boating, picnicking, camping, and activities relating to open space.

Three different plans were considered for the region -- one emphasizing the environmental quality objective (EQ), one emphasizing the economic development objective (ED), and a composite plan which incorporates the social well-being objective (SW). The plans were developed from alternatives outlined in Section 7 and evaluated with respect to specific objectives in Section 8 and Appendix E. The final plan of action based on the composite plan is presented in this section.

TABLE 19. SUMMARY EVALUATION OF COMBINED ALTERNATIVES

	Environmental Quality (EQ)	Economic Development (ED)	Social Well-Being (SW)
Public acquisition/development of vacant land	Good	Good	Good
Relocation from flood plain	Good	Fair	Good
Multiple use of watershed lands	Fair	Good	Fair
Multiple use of public utility lands	Fair	Good	Good
Voluntary alteration of work week	Good	Fair	Good
Open parks & beaches to all on weekdays	Fair	Fair	Good
Coordination of public transit schedules	Good	Fair	Good
Development and expansion of existing parks & beaches	Fair	Good	Good
Property tax allowance for public use of private land	Fair	Fair	Fair
Property tax allowance to private entrepreneur	Fair	Fair	Fair
Expansion and diversification of urban recreation programs	Good	Fair	Good
Regulated land use in open space system	Good	Fair	Fair
Development of artificial islands	Poor	Fair	Fair
Development of public marinas	Fair	Good	Good
Development of ferry service	Good	Fair	Good

9.1 Environmental Quality Plan

Narrowly construed, a recreation plan emphasizing environmental quality for the region would rely mainly on activities requiring extensive use of open space and the shorefront such as hiking and nature study. Sailing would be favored over motor boating. Public transportation would be encouraged over the automobile to move people to the recreation resources. Table 19 shows the relationship of recreation alternatives to environmental quality concerns. The alternative of developing artificial islands received a poor rating and the alternative of developing existing parks and beaches is only listed as fair because of the poor rating given to beach nourishment in Table 10 as part of that alternative.

Long Island Sound is called an urban sea and recreation demands made of its shoreline are more diverse and intense than would be allowed by strictly environmentally compatible activity.

9.2 Economic Development Plan

Narrowly construed, a recreation plan emphasizing economic development for the region would rely mainly on activities with high economic return such as private golf courses, tennis, swim, and yacht clubs. Large craft would be favored over small boats and private beaches would be favored over public beaches open to all. Table 19 shows the relationship of recreation alternatives to economic development concerns. All alternatives are considered to have at least fair contribution to economic development. Fewer alternatives are rated good for ED than EQ or SW.

9.3 Composite Plan

The Composite Plan would emphasize accomodation between the EQ and ED Plans. Where these two plans agreed, their joint conclusion would be embodied in the Composite Plan. The only alternative not in agreement would be development of artificial islands so it would therefore be dropped from the Composite Plan.

The Composite Plan represents the recommendations of the Recreation Work Group, and these recommendations are presented in Section 10.

9.4 Sources of Federal Funding and Technical Assistance

Sources of Federal funding and technical assistance which can aid in implementing the Composite Plan are listed in Table 20. In all cases, Federal involvement is supplementary to local initiative.

A case study of implementation procedures for recreation alternatives was conducted in Bridgeport, Connecticut (28). Ten outdoor recreation projects were identified and specific steps toward implementation were outlined.

Space restrictions in this report do not allow for presentation of the Bridgeport case study or a similar one for the entire Study area.

TABLE 20 SOURCES OF FEDERAL FUNDING AND TECHNICAL ASSISTANCE

Source: (28) and Catalog of Federal Domestic Assistance

Federal Programs	Planning Alternatives							
	Public Acquisition Development	Private Acquisition Development	Relocation From Flood Plain	Multiple Use of Watershed Lands	Multiple Use of Public Utilities	Develop Existing Parks and Beaches	Expand & Diversify Urban Rec. Programs	Development of Public Marinas
Technical Assistance in Outdoor Recreation	X	X	X	X	X	X	X	X
Park & Recreation Technical Assistance	X					X		
Outdoor Recreation Acquisition, Development And Planning (Land And Water Conservation Fund Grants)	X		X	X1/	X1/	X		X
Disposal of Federal Surplus Property	X					X		
Beach Erosion Control						X		
Small Watershed Projects				X				
Small Business Management Counseling		X						
Small Business Technical Assistance		X						
Federal Assistance to Boating Safety Programs								X
Physical Fitness and Sports Assistance							X	
Special Programs for the Aging							X	
Recreation Support Program							X	
Operation Mainstream							X	
National On-the-Job Training							X	
Employment Service							X	
Work Incentive Programs							X	

1/ With minimum 25 year lease

10.0 WORK GROUP RECOMMENDATIONS

This section summarizes the major outdoor recreation recommendations of the work group -- detailed information for each of the site specific recommendations below is to be found in Appendix D1. However, the FINAL RECOMMENDATIONS on outdoor recreation are to be found only in the final version of the Long Island Sound Study main report.

State Actions

- Acquisition and development of Ram Island in the Mystic Island Group, Hatchett Point in Old Lyme, additional land adjacent to Hammonasset State Park in Madison, Charles Island in Milford, and Pleasure Beach and Long Beach in Bridgeport by 1990. Also, acquisition and development by 2020 of the remaining properties which are proposed for state action and listed in Appendix D1.
- Redevelopment of the following beaches for recreation by 1990 prior to severe tidal flooding: Sound View Beach in Old Lyme, Giant's Neck at Rocky Neck State Park, Fort Trumbull Beach in Milford, additional land at Sherwood Island State Park in Westport, and the beach east of the mouth of Wading River in Brookhaven.
- Formulation of state and local contingency fund by 1990 to "land bank" shorefront property that has been damaged by natural disaster.
- Development and expansion of existing state parks and beaches by 1990 as described in Appendix D1.
- The states should have a role in regulating land use for an open space system. See the main report for specifics.
- Enabling legislation should be enacted by 1990 to allow right of first refusal to the state and then to the municipality for purchase of any private recreation property which is for sale, such as a marina, golf course, private club, or watershed lands.
- Enabling legislation should be enacted by 1990 to allow tax assessment of private recreation property which is open to the general public to reflect the rate of return on investment which the property generates. In addition, private landowners who permit public access across their properties without charging a fee should receive a property tax allowance.

Local Actions

- Acquisition and development of Kelsey Island in Branford, Sheffield Island in Norwalk, Fox Point in Oyster Bay, and additional acreage in the sand pits of Hempstead Harbor by 1990. Also, acquisition and development by 2020 of the remaining properties which are proposed for local action and listed in Appendix D1.

- Redevelopment of the town-owned beach in West Haven by 1990 prior to severe tidal flooding.

- Formulation of a state and local contingency fund by 1990 to "land bank" shorefront property that has been damaged by natural disaster.

- Development and expansion of existing local parks and beaches by 1990 as described in Appendix D1.

- Local parks and beaches should be open to the general public on weekdays by 1990. A standard park sign should be adopted region-wide to display times of restricted use.

- Expansion and diversification of urban recreation programs.

- Development of public marinas by 1990 as detailed in Appendix D1.

State or Local Actions

- Acquisition and development by 1990 of David's Island in New Rochelle, Fort Totten in Queens, additional land on Orient Point in Southhold, and the beach and bluffs between Roanoke Point and Jacobs Point in Riverhead.

Quasi-Public and Private Actions

- Development of picnic and camp grounds on the watershed lands owned by water companies by 1990 as listed in Appendix D1. Development and maintenance costs should be reimbursed by public funds and a lower property tax assessment.

- Multiple use of existing public utility lands as listed in Appendix D1.

- Access to the water for recreation should be incorporated at all future public utilities bordering on the Sound, where appropriate.

- Development of passenger-only ferry routes by 1990 between certain towns and parks as listed in Appendix D1.

- The standard five-day work week should be modified by 1990 by private, voluntary action to ease the weekend pressures on recreation properties and transportation facilities.

- Coordination of public bus, train, and ferry schedules during leisure time periods by 1990.

Additional State, Local and Private Actions

- In Appendix D2 are listed additional opportunities for improving and expanding recreation in the LISS area. These site specific proposals are not developed more than to indicate where and what kind of opportunities exist. No time frame for development is suggested. These opportunities include the estimated limit for expansion of boat storage facilities in coves, harbors, and rivers around the Sound; beaches with potential for recreational redevelopment following a natural disaster; the potential recreation capacity of Connecticut reservoir watershed lands, assuming an appropriate change in present Connecticut public health laws; and the potential for connecting existing hiking trails with new trails to form a trail system around the Sound.

11.0 FINAL RECOMMENDATIONS

The preceding recommendations have not necessarily been approved by the New England River Basins Commission. At the time of this report's publication, the draft main report of the Long Island Sound Regional Study is undergoing public review and comment for consideration in the final document. The FINAL RECOMMENDATIONS on Outdoor Recreation are therefore to be found only in the final version of the Study's main report - to be published in the spring of 1975.

APPENDIX A

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Interim Reports on:

- Sources and Movements of Water
- Soils
- Water Quality
- Ecological Studies
- Mineral Resources and Mining
- Electric Power Generation
- Water Supply
- Flood Plains
- Recreation
- Scenic and Cultural Resources
- Erosion and Sedimentation

Special Reports on:

- An Economic Perspective
- Goals for the Region
- Public Workshops and Hearings
- Bibliography for Planning
- Design Handbook and Atlas
- Legal and Institutional Issues

Planning Reports on:

- Land Use (P-1)
- Water Quality and Water Supply (P-2)
- Shoreline Appearance and Design (P-3)
- Erosion and Sedimentation (P-4)
- Flood Damage (P-5)
- Recreation (P-6)
- Fish and Wildlife (P-7)
- Marine Transportation (P-8)
- Minerals (P-9)
- Power and Environment (P-10)

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APPENDIX B

DEMAND METHODOLOGY

Demand for Outdoor Recreation = a schedule of the quantity of outdoor recreation opportunity people are willing and able to pay for at one point in time with a given level of opportunity conditions.

The magnitude of recreation demand as it relates to each subregion, facility unit, and bench mark year is shown in Table 1. The following formula was used to derive the subregion activity demand relating to facility units as shown in that table.

$D = RPCF$

in which:

D = Demand in summer season activity days for resources located by subregion. The demand was calculated for the NAR Study bench mark years of 1980, 2000, and 2020. The 1990 bench mark year date appearing in Table 1 was then derived from a straight line mathematical interpolation between 1980 and 2000 year data.

R = NAR Study (12) per capita participation rate projections for recreation activities are listed on page B-3. Sailing and boating rates were added together to estimate demand for boat ramps and slips.

P = County population, as projected for this Study in the Series E national population projections of the Bureau of Economic Analysis, U.S. Department of Commerce, as listed on page B-2.

C = Facility coefficient, percent of demand for each activity assumed to be met by the specified facility. The magnitude of this coefficient for each activity is as follows:

Activity	Facility Coefficient
Beach Swim	60% for beaches
Picnic	80% for picnic sites
Camp	80% for camp sites
Boat and Sail	40% for boat launch ramp
Boat and Sail	30% for slips or moorings

F = Demand distribution factor, as listed on page B-4 as the percent of demand generated by a designated county to be met by subregion resources. This reflects the magnitude of the recreation market area relations to the subregions by activity.

Example - Compute the activity day demand for campgrounds in Subregion 1 for the year 2020.

D = RPCF = (1.78)(353,000)(.8)(4) = 2,010,688 activity days for camping.

As indicated by the demand distribution assumption for camping shown on page B-4, the demand for the camping facilities in Subregion 1 is generated from a population four times the size of the New London County population.

Population Projections

County	1970	1980	1990	2000	2020
New London, Conn.	231,170	259,700	289,000	312,700	353,000
Middlesex, Conn.	115,275	139,700	164,900	186,300	224,000
New Haven, Conn.	746,614	839,400	928,100	993,100	1,107,000
Fairfield, Conn.	794,588	893,900	990,500	1,068,500	1,203,000
Westchester, N.Y.	895,372	994,700	1,059,600	1,106,400	1,188,000
Nassau, N.Y.	1,430,305	1,580,400	1,677,000	1,719,500	1,794,000
Suffolk, N.Y.	1,128,187	1,635,800	2,146,800	2,596,900	3,380,000
Total	5,341,511	6,343,600	7,256,800	7,983,400	9,249,000

Participation Rates

North Atlantic Regional Water Resources Study
Appendix M, Outdoor Recreation
National Efficiency Per Capita Participation Rates for the Summer Season for the New England Census Region
Activities and Target Years

		New England Rates
Boating	1980	3.68
	2000	4.85
	2020	6.20
Swimming	1980	15.15
	2000	19.86
	2020	23.44
Camping	1980	0.95
	2000	1.32
	2020	1.78
Picnicking	1980	5.50
	2000	6.16
	2020	8.17
Sailing	1980	1.01
	2000	1.53
	2020	2.20

Assumptions on Distribution of Demand

Subregion Number	County	% of County Recreation Activity Day Demand Estimating Subregion Demand (res. & non-res.)				
		Picnic	Camp	Beach Swim	Boat Ramp	Boat Slip
1	New London	60	400	225	125	300
2	Middlesex	60	300	210	220	545
3	New Haven	65	110	150	45	100
4	Fairfield	40	35	45	20	70
5	Fairfield	20	100	50	60	270
6	Westchester Nassau	20	10	50	20	90
7	Suffolk	30	15	40	15	45
8-9	Suffolk	30	50	20	10	10

APPENDIX C

REQUIREMENTS METHODOLOGY

The method for translating recreation demand in Table 1 into resource requirements for Table 2 is summarized by the following formula:

$$R = \frac{D}{CTU} \quad S$$

where:

R = Resource requirements in specified units (e.g., miles of beach, acres, ramps, or slips). The resource requirements were calculated for the NAR bench mark years of 1980, 2000, and 2020. The 1990 bench mark year data was derived from a straight line mathematical interpolation between 1980 and 2000 year.

D = Demand in summer season activity days, taken from Table 1.

C = Capacity utilization days; the number of days which, when multiplied by the capacity of the facility, will be equivalent to the total seasonal attendance. It is taken from the NAR Study (12) and varies with climate and expected changes in leisure time.

The magnitude of these factors is as follows:

1980 - 43 days

2000 - 48 days

2020 - 56 days

T = Turnover rate, mean number of parties at each facility unit per day.

Activity	Turnover Rate
Beach Swim	2 people per space occupied by a bather
Picnic	2 parties per picnic site

Activity	Turnover Rate
Camp	1 party per camp site
Boat	37.5 parties per boat ramp lane 1.5 parties per slip or mooring

U = Unit capacity, number of persons accommodated simultaneously at a facility unit.

Activity	Unit Capacity
Beach Swim	1 person
Picnic	5 people per picnic site
Camp	4 people per camp site
Boat	4 people per boat

S = Spatial factors assigned to the facility units are as follows:

Activity	Spatial Factor
Picnic	25 picnic sites per acre
Camp	5 camp sites per acre
Beach Swim	
Linear feet	.3 feet of guarded beach shoreline per person which is equivalent to 65 square feet of beach per person for a beach depth of 150 feet assuming 30 percent of beach patrons are in the water at any one time.
Automobile Access	.003 acres per person for the total beach facility assuming all patrons utilized automobile transportation with an average of four persons per vehicle.

Activity	Spatial Factor
Beach Swim (Continued)	.0014 acres per person for the total beach facility assuming all patrons utilized bus transportation with an average of 40 persons per vehicle.

Example - Compute the resource requirements for campgrounds in Subregion 1 for the year 2020.

$$R = \frac{D}{CTU} \qquad S = \frac{2 \times 10^6}{(56)(1)(4)} \quad .05 = 446$$

, rounded to 450 acres in Table 2

APPENDICES D1 AND D2

SITE SPECIFIC PROPOSALS

FOOTNOTES TO APPENDIX D1

Specific project proposals are listed here. Footnotes to the tables are as follows:

1/ A - acres of property

PU - picnic units - except for island proposals, facilities includes bituminous access road and central parking area, centralized drinking water and sanitary facility, table, fire place, trash receptical.

CU - camp unit - except for island proposals, facilities at a density of 5 sites per acre include bituminous access roads and parking space, centralized drinking water and sanitary facilities, table, fire place, trash receptical and landscaping for screening.

MB - miles of swimming beach - except for island proposals, facilities include beach, bathhouse, bituminous parking area and access road, walkways and play area.

SL - boat slip - floating finger docks with 20 foot depth for transient boat facilities.

M - mooring fore and aft

R - boat launching facility - facilities include 1/3 acre bituminous parking lot, simple moorings, 1 launch lane consisting of precast concrete planks on a layer of trap rock, boom hoist.

DS - dry storage of boat - typical facilities includes storage of 400 non-keel boats up to 25 feet long, 45 feet high and covering 1/2 acre of water and 1/2 acre of shorefront land with 1 acre for parking lot.

2/ All cost figures based on 1974 dollars. Acquisition and development costs have not been amortized over time for each proposal. These figures represent estimated "one-time" costs.

Acquisition - assessed property value per acre X number of acres of proposal. Where no cost figure appears, acquisition for recreation involves transfer of administrative titles.

Development - PU = $1,000
CU = $4,000
MB = $5,000,000 per .5 miles of beach at 10,000 instant capacity.
SL = $600
M = $100
R = $50,000
DS = $400,000 per 400 craft unit

Maintenance - PU = .25 X development cost of PU
CU = .2 X development cost of CU
MB = .05 X development cost of MB
SL = .1 X development cost of SL
M = .1 X development cost of M
R = .1 X development cost of R

Cost includes maintenance and operation expenses

3/ All benefit figures based on 1974 dollars, and represent annual benefits.

$$\text{Benefit} = \frac{CTU}{A} \quad V$$

C = capacity utilization days (see Appendix C)
T = turnover rate (see Appendix C)
U = unit capacity (see Appendix C)
A = activity participation = 1.5 activities per day
This factor converts activity days to annual recreation days in order to avoid double counting benefit when a visitor to a park pursues more than one activity.
V = unit value per annual recreation day per person
The assigned unit values for LIS reflect such quality considerations as attractiveness of facilities, scenic characteristics of the area and the degree to which alternative opportunities are available.

The following 3 values were assigned.

$3 - unit value assigned to inland recreation facilities

This magnitude reflects the value of inland recreation opportunities for the Study Region.

$5 - unit value assigned to shoreline recreation facilities

The magnitude reflects the value of recreation opportunities on less densely populated portions of the shoreline.

$7 - unit value assigned to shoreline recreation facilities in areas of great need. This magnitude reflects the value of recreation opportunities on densely populated portions of the shoreline.

A benefit value for extensive recreation activities is assigned to the acreage of the properties as follows:

$$\text{Benefit per acre} = \frac{CTU}{A} V = \frac{43 \times 2 \times 1}{1.5} V$$

Site Specific Proposals

Subregion Town	Site Name	Alternative	Proposal (1)	Costs ($000's) (2) Acquisition	Development	Maintenance	Benefits ($000's) (3)	
			SUBREGION 1					
Bozrah	Hopemead State Pk. Add.	Acquisition (State)	770 A	1,540			3	132
			250 PU		250	62.5		214
			150 CU		600	120		51
East Lyme	Powers Lake*	Acquisition (State)	900 A acres	1,800			3	154
			100 PU Picnic units		100	25		86
			50 CU Camp units		200	40		17
			1 R Boat ramp		50	5		13
	Niantic State Farm for Women (Bride Lake)	Acquisition (State)	850 A				3	145
			100 PU		100	25		86
			400 CU		1600	320		138
	Giants Neck	Redevelopment (Prior)	20 A	800			5	6
			0.4 MB		4000	200		2284
Franklin-Sprague	Susquehanna Plains	Acquisition (State)	2200 A	4,400			3	376
			500 PU		500	125		429
			200 CU		800	160		69
			2 R		100	10		26

*If and as becomes available from Yale's Sheffield School of Engineering

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Site Specific Proposals

Subregion Town	Site Name	Alternative	Proposal (1)	Costs ($000's) (2)			Benefits ($000's) (3)	
				Acquisition	Development	Maintenance		
			SUBREGION 1					
Griswold	Hopeville Pond St. Pk. Add.	Acquisition (State)	90 A	180			3	15
			400 PU		400	100		343
	Pachaug Pond	Acquisition (State)	700 A	1,400			3	120
			250 PU		250	62.5		214
			100 CU		400	80		34
Groton	Bluff Point St. Pk.	Efficient Use	500 PU		500	125	5	715
			0.5 MB		5000	250		2850
	Bluff Point St. Pk.	Ferry Service						
Ledyard	Mohegan-Pequot St. Pk. Add.	Acquisition (State)	350 A	1,400			3	60
			125 PU		125	32		107
Montville	Bartlet Cove	Multiple Use (power plant)	2 R		100	10	3	26

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Site Specific Proposals

Subregion Town	Site Name	Alternative	Proposal (1)	Costs ($000's) (2) Acquisition	Development	Maintenance	Benefits ($000's) (3)	
			SUBREGION 1					
Preston	Long Rock	Multiple Use (St. Hospital)	2 R		100	10	3	26
Stonington	Barn Island	Multiple Use (Hunting)	2 R		100	10	3	26
	Ram Island	Acquisition (State)	15 A	200			5	4
			0.5 MB		5000	250		2850
	Ram Island	Ferry Service						
Voluntown	Beach Pond	Acquisition (State)	450 A	675			3	77
			500 PU		200	50		172
			200 CU		400	80		34
	Green Fall Pond	Acquisition (State)	235 A	352			3	40
			100 PU		50	12.5		43
			50 CU		200	40		17
			1 R		50	5		13
			SUBREGION 2					
Deep River	Messerschmidt Pond	Acquisition (State)	500 A	2,550			3	86
			100 PU		100	25		86
			100 CU		400	80		34

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Site Specific Proposals

Subregion Town	Site Name	Alternative	Proposal (1)	Costs ($000's) (2)			Benefits ($000's) (3)	
				Acquisition	Development	Maintenance		
			SUBREGION 2					
Essex	Eustacia Island	Ferry Service						
	Selden Neck St. Pk.	Ferry Service						
Killingworth	Chatfield Hollow St. Pk. Addition	Acquisition (State)	1400 A	3,500			3	241
			400 PU		400	100		516
			100 CU		400	80		103
Old Lyme	Hatchett Point	Acquisition (State)	630 A	3,150			7	251
			200 PU		200	50		400
			0.5 MB		5000	250		4000
			2 R		100	1		60
	Sound View Beach	Redevelopment (Prior)	130 A	5,200			7	24
			1.0 MB		10,000	500		8000
			SUBREGION 3					
Bethany	Lake Watrous	Multiple Use (Watershed)	50 PU		50	12.5	3	43
			50 CU		200	40		17
Branford	Kelsey Island	Acquisition (Local)	11 A	165			5	3
			50 SL		30	3		43
			0.3 MB		3000	150		1710

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Site Specific Proposals

Subregion Town	Site Name	Alternative	Proposal (1)	Costs ($000's) (2) Acquisition	Development	Maintenance	Benefits ($000's) (3)	
			SUBREGION 3					
Madison	Hammonasset St. Park Add.	Acquisition (State)	900 A	4,500			3	154
			1000 PU		1000	250		858
			2 R		100	10		26
	Hammonasset Valley	Multiple Use (Watershed)	200 PU		200	50	3	172
			75 CU		300	60		26
Milford	Charles Island	Acquisition (State)	11 A	165			7	4
			0.3 MB		3000	150		2400
			100 SL		60	6		120
	Ft. Trumbull Beach	Redevelopment (Prior)	2 A	80			7	1
			0.5 MB		5000	250		4000
	Silver Sands State Park	Efficient Use	0.4 MB		4000	200	7	3200
			100 PU		100	25		200
	Gravel Mine	Multiple Use (Mining)	2 R		100	10	3	26
New Haven	Lighthouse Pt. Park	Efficient Use	4 R		200	20	5	86
	Lighthouse Pt.	Ferry Service						
	Naval Reserve	Multiple Use (Military)	4 R		200	20	7	120

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Site Specific Proposals

Subregion Town	Site Name	Alternative	Proposal (1)	Costs ($ 000's)(2) Acquisition	Costs ($ 000's)(2) Development	Costs ($ 000's)(2) Maintenance		Benefits (3) ($ 000's)
		SUBREGION 3						
New Haven	New Haven Harbor	Redevelopment (Prior)	8 A	480			7	3
			1000 SL		600	60		1204
			1000 M		100	10		1204
			4 R		200	20		120
			1200 DS		1200			970
N. Branford	Lake Gaillard	Multiple Use (Watershed)	200 PU		200	50	3	172
			50 CU		200	40		17
Orange	Turkey Hill	Acquisition (State)	300 A	750			3	51
			200 PU		200	50		172
West Haven	Maltby Lakes	Multiple Use (Watershed)	50 PU		50	12.5	3	43
	Sandy Point	Redevelopment (Prior)	2.0 MB		20,000	1,000	7	16,000
Willingford	Sleeping Giant State Park Add.	Acquisition (State)	275 A	825			3	47
			100 PU		100	25		86
		SUBREGION 4						
Bridgeport	Pleasure Beach	Acquisition (State)	200 A				7	80
			100 PU		100	25		200
			100 SL		60	6		120
			2 R		100	10		60

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Site Specific Proposals

Subregion Town	Site Name	Alternative	Proposal (1)	Costs ($ 000's)(2)			Benefits (3) ($ 000's)	
				Acquisition	Development	Maintenance		
		SUBREGION 4						
Bridgeport	Pleasure Beach	Ferry Service						
	Long Beach	Acquisition	60 A	300			7	2
		(State)	1.2 MB		12,000	140		9600
	Bridgeport	Redevelopment	3 A	180			7	1
	Harbor	(Prior)	500 SL		300	30		602
			800 DS		800			644
	Seaside Park	Efficient Use	4 R		200	20	7	120
	Lewis Gut	Multiple Use	2 R		100	10	5	43
		(Oil Tanks)						
	Success Lake	Acquisition	320 A	960			3	55
		(Local)	250 PU		250	62.5		214
Easton	Hemlock	Multiple Use	100 PU		100	25	3	86
	Reservoir	(Watershed)						
	Easton	Multiple Use	100 PU		100	25	3	86
	Reservoir	(Watershed)						
Shelton	Buttermilk	Acquisition	20 A	60			3	3
	Hollow	(Local)	30 PU		30	7.5		26
			2 R		100	10		26

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Site Specific Proposals

Subregion Town	Site Name	Alternative	Proposal(1)	Costs ($ 000's)(2)				Benefits ($ 000's)(3)
				Acquisition	Development	Maintenance		
SUBREGION 5								
Norwalk	Sheffield Island	Acquisition (Local)	50 A	750			5	14
			200 SL		120	12		172
			0.3 MB		3000	150		1710
			50 PU		50	12.5		72
	Sheffield Island	Ferry Service						
	Manresa Island	Multiple Use (Power Plant)	2 R		100	10	7	60
Westport	Sherwood Island State Park Add.	Acquisition (State)	110 A	2200			7	44
			500 PU		500	125		1001
			6 R		300	30		181
			0.8 MB		8000	400		6400
Weston	Canfield Hill	Acquisition (Local)	300 A	1500			3	51
			50 PU		50	12.5		43
	Saugatuck Reservoir	Multiple Use (Watershed)	250 PU		250	62.5	3	214
			250 CU		100	20		86
SUBREGION 6								
Bronx	City Island	Redevelopment (Prior)	2 A	120			7	1
			800 DS		800			644

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Site Specific Proposals

Subregion Town	Site Name	Alternative	Proposal(1)	Costs ($ 000's)(2)			Benefits(3) ($ 000's)	
				Acquisition	Development	Maintenance		
			SUBREGION 6					
Bronx	Hart Island	Efficient Use	300 PU		300	75	5	429
			300 SL		180	18		258
	Rodman Neck	Multiple Use	6 R		300	30	7	181
Great Neck	Inlet to Udall's Cove	Acquisition (Local)	10 A	150			3	2
Mamaroneck	Hempshire Country Club	Multiple Use	2 R		100	10	7	60
New Rochelle	David's Island	Acquisition (State or Local)	50 A	1000			5	14
			200 PU		200	50		286
			50 SL		30	3		43
			0.8 MB		8000	400	7	6384
	David's Island	Ferry Service						
	Echo Bay	Multiple Use (Sewage Treatment)	4 R		200	20	7	120
N. Hempstead	Hempstead Harbor	Redevelopment (Prior)	4 A	240			7	1.6
			1200 SL		720	72		1445
			1200 DS		1200			966
			4 R		200	20		120
	Hempstead Harbor Park	Efficient Use	4 R		200	20	7	120

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Site Specific Proposals

Subregion Town	Site Name	Alternative	Proposal(1)	Costs ($ 000's) Acquisition	Costs ($ 000's) Development	Costs ($ 000's) Maintenance	Benefits ($ 000's)	
			SUBREGION 6					
	Sand Pits Addition	Acquisition (Local)	300 A	15,000			5	86
			1000 PU		1000	250		1430
			1000 CU		4000	800		575
	Whitney Estate	Acquisition (Local)	187 A	5610			3	32
Oyster Bay	Fox Point	Acquisition (Local)	5 A	375			5	1.4
			0.3 MB		3000	150		1710
	South of Coldspring Harbor	Acquisition (Local)	600 A	12,000			3	103
Queens	Fort Totten	Acquisition (State or Local)	143 A				7	59
			400 SL		240	24		482
			400 M		40	4		482
			1200 DS		1200			966
			0.7 MB		7000	350		5586
			100 PU		100	25		40
Rye	Playland Park	Efficient Use	0.3 MB		3000	150	7	2394
			6 R		300	30		181
	Rye Country Club	Multiple Use	2 R		100	10	7	60

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Site Specific Proposals

				Costs ($ 000's)				
Subregion Town	Site Name	Alternative	Proposal$^{(1)}$	Acquisition	Development	Maintenance		Benefits ($ 000's)
			SUBREGION 7					
Brookhaven	Harbor Hills Country Club	Multiple Use	2 R		100	10	5	43
	Port Jefferson Harbor	Redevelopment	4 A	160			5	1.1
			500 SL		300	30		430
			500 M		50	5		430
			1200 DS		1200			690
			4 R		200	20		86
	Port Jefferson Harbor Sand Spits	Ferry Service						
	Shoreham	Multiple Use (Power Plant)	1000 PU Parking Garage		1000	250	5	1430
	Indian Hills Country Club	Multiple Use	2 R		100	10	5	43
Huntington	Caumsett State Park	Efficient Use	1.5 MB		15,000	250	7	12,000
			200 PU		200	50		400
			200 CU		800	160		161
			200 SL		120	12		241
Huntington	Caumsett State Park	Ferry Service						
	Industrial Home for the Blind	Multiple Use	2 R		100	10	5	43
Smithtown	Kings Park State Hospital	Multiple Use	4 R		200	20	5	86

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Site Specific Proposals

Subregion Town	Site Name	Alternative	Proposal(1)	Costs ($ 000's) Acquisition	Costs ($ 000's) Development	Costs ($ 000's) Maintenance		Benefits ($ 000's)
			SUBREGION 8 - 9					
Brookhaven	Wading River	Redevelopment (Prior)	0.5 A	20			5	.1
			0.6 MB		6000	300		3420
			2 R		100	10		43
Riverhead	Wildwood State Park	Efficient Use	0.5 MB		5000	250	5	2850
			100 CU		400	80		58
			200 SL		120	12		172
	Roanoke Point Jacobs Point	Acquisition (State or Local)	450 A	4500			5	128
			2.0 MB		20,000	1000		11,400
			200 PU		200	50		286
			100 CU		400	80		58
Southhold	Orient Point Addition	Acquisition (State or Local)	40 A	650			5	11
			200 PU		200	50		286
	Truman Beach	Redevelopment (Following)	1.0 MB	40	10,000	500	5	5700

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APPENDIX D2

Potential Recreational Capacity of Connecticut Reservoirs and Watershed Lands:

Subregion 3	Proposal (1)
Lake Watrous	50 PU, 200 CU
Lake Saltonstall	200 PU, 200 CU
Lake Gaillard	200 PU, 500 CU
Maltby Lakes	200 PU
Subregion 4	
Saugatuck Reservoir (Easton)	500 PU, 150 CU
Hemlock Reservoir	500 PU, 300 CU
Easton Reservoir	500 PU, 300 CU
Means Brook Reservoir	500 PU, 300 CU
Trap Falls Reservoir	200 PU, 100 CU
Subregion 5	
Laurel Reservoir	200 PU, 200 CU
Laurel Pond	200 PU, 200 CU
Saugatuck Reservoir (Weston)	250 PU, 250 CU

(1) PU - Picnic Unit
CU - Camp Unit
More complete descriptions of these units appear on page D1-1.

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APPENDIX D2

Beaches with Potential for Redevelopment Following Natural Disaster for Public Recreation

Town	Beach Name	Miles of Beach
SUBREGION 2		
Clinton	Cedar Island	0.4
	Duck Island Roads	1.5
Old Lyme	Hawk's Nest	1.1
Old Saybrook	Corn Field Point	1.3
SUBREGION 3		
East Haven	Shell to Mamaugium	2.0
Madison	Circle of East River	0.6
Milford	Milford Point to Myrtle	2.9
	Bayview and Point	0.8
SUBREGION 4		
Fairfield	Pine Creek Point	2.0
Westport	Owenoke	0.4
SUBREGION 6		
Bronx	Park of Edgewater	0.4
Oyster Bay	Ferry Beach	1.5
	Oyster Bay	0.4
SUBREGION 7		
Brookhaven	Mt. Sinai	0.5
	West Meadow	1.1
Huntington	Asharoken	1.7
SUBREGION 8-9		
Riverhead	Baiting Hollow	1.3
Southhold	Truman	1.0
STUDY REGION TOTAL	18 SITES	20.9

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APPENDIX D2

Potential Expansion of Boat Storage Facilities (# of boats)

	Wet Storage	Dry Storage
Subregion 1		
Beebe Cove	300	
Mystic Harbor	800	800
Wiantic River	500	800
Subregion 2		
Clinton Harbor	500	
North Cove	500	400
Subregion 3		
Milford Harbor	300	
Housatonic River	600	1,200
Farm River	200	
New Haven Harbor	3,200	1,200
Subregion 4		
Johnson's Creek	300	800
Bridgeport Inner Harbor	500	800
Housatonic River	500	400
Subregion 5		
Indian Harbor	200	
Norwalk Harbor		800
Saugatuck River	200	
Subregion 6		
Larchmont Harbor		400
Mamaroneck Harbor		400
Little Neck Bay	800	1,200
Hempstead Harbor	1,200	1,200
Manhasset Bay		800
Oyster Bay Harbor		800
Subregion 7		
Port Jefferson Harbor	1,400	1,200
Cold Spring Harbor	1,000	
Huntington Harbor		800
Stony Brook Harbor	200	
Mt. Sinai	200	
Study Region Totals	13,400	14,000

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APPENDIX D2

Existing Hiking Trails in Southern Connecticut

Map Reference	Region 1	Towns	Length	Component Trails
1	Pachaug State Forest Trail Complex	Griswold, Voluntown	44 miles	Nehantic, Pachaug Quinebaug, Castle, and Cannonicus Trails
2	Pequot Trail	Preston, Ledyard N. Stonington	10 miles	
3	Narragansett Trail	Ledyard	16 miles	
	Region 2-3			
4	Mattabessett Trail	Haddam, Durham, Madison, Guilford, N. Branford Wallingford, Meriden	50 miles	
5	Chatfield Hollow Trails	Clinton	8.5 miles	Chatfield Hollow Tr. Deep Woods Trail Fire Tower Trail
6	Westwood Trails	Guilford	10 miles	
7	Quinnipiac Trail	N. Haven, Hamden, Cheshire, Prospect	45 miles	
8	Regicides Trail	New Haven, Hamden	5 miles	
9	Sleeping Giant State Park Complex	Hamden	25 miles	
	Region 4			
10	Paugussett Trail	Shelton, Monroe		
11	Pomperaug Trail	Monroe	10 miles	

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APPENDIX D2

Existing Walking Parks on Long Island

Map Reference		Town
12	Sunken Meadow State Park	Smithtown
13	Wild Wood State Park	Riverhead
14	Nissequogue River State Park	Smithtown
15	Nassau County Museum of Natural History	Glen Cove
16	Theodore Roosevelt Memorial Sanctuary and Trailside Museum	Oyster Bay
17	Planting Field Arboretum	Oyster Bay
18	Baily Arboretum	Locust Valley
19	Fanny Dwight Clark Memorial Garden	Albertson
20	North Shore Bird and Game Sanctuary	Mill Neck
21	Muttontown Natural Preserve	East Norwich
22	Target Rock National Wildlife Sanctuary	Lloyd Neck

None of these facilities offers hiking or other cross country experience. Use of some of these areas maybe controlled.

Other local parks are available to local residents, but are not open to the general public.

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APPENDIX D2

Potential Trails

Map Reference	Trail Description	Towns
23	Mystic River to Narragansett Trail	Groton, Stonington, North Stonington
24	Niantic River and Nehantic State Forest	East Lyme and Lyme
25	Connecticut River and Salmon River State Forest	Colchester, East Haddam, Lyme and Old Lyme
26	Hammonasset River to Chatfield Hollow State Park	Clinton, Madison, Killingworth
27	Saltonstall Ridge to the Mattabessett Trail	Branford, North Branford, E. Haven
28	Quinnipiac Trail Extension	N. Haven and Wallingford
29	Maltby Lakes to Regicides Trail	West Haven, New Haven
30	Housatonic Valley Trails Development	Ansonia, Derby, Shelton, Monroe
31	Aspetuck River Valley	Westport, Fairfield, Easton
32	L.I.S. to Aspectuck River	Fairfield
33	Saugatuck River Valley	Westport and Weston
34	Route 7 Linear Park	Norwalk, Wilton
35	N. Stamford Res. to Pound Ridge Reservation	Stamford
36	Mianus River Valley	Stamford
37	Orchard Beach, Bronx Park and Ferry Point Park Link	Bronx
38	Manhasset Bay and Hempstead Harbor Link	Sands Point
39	Mt. Sanai and Mount Misery Point Link	Port Jefferson
40	Wildwood State Park to Orient Point Link	Riverhead, Southhold

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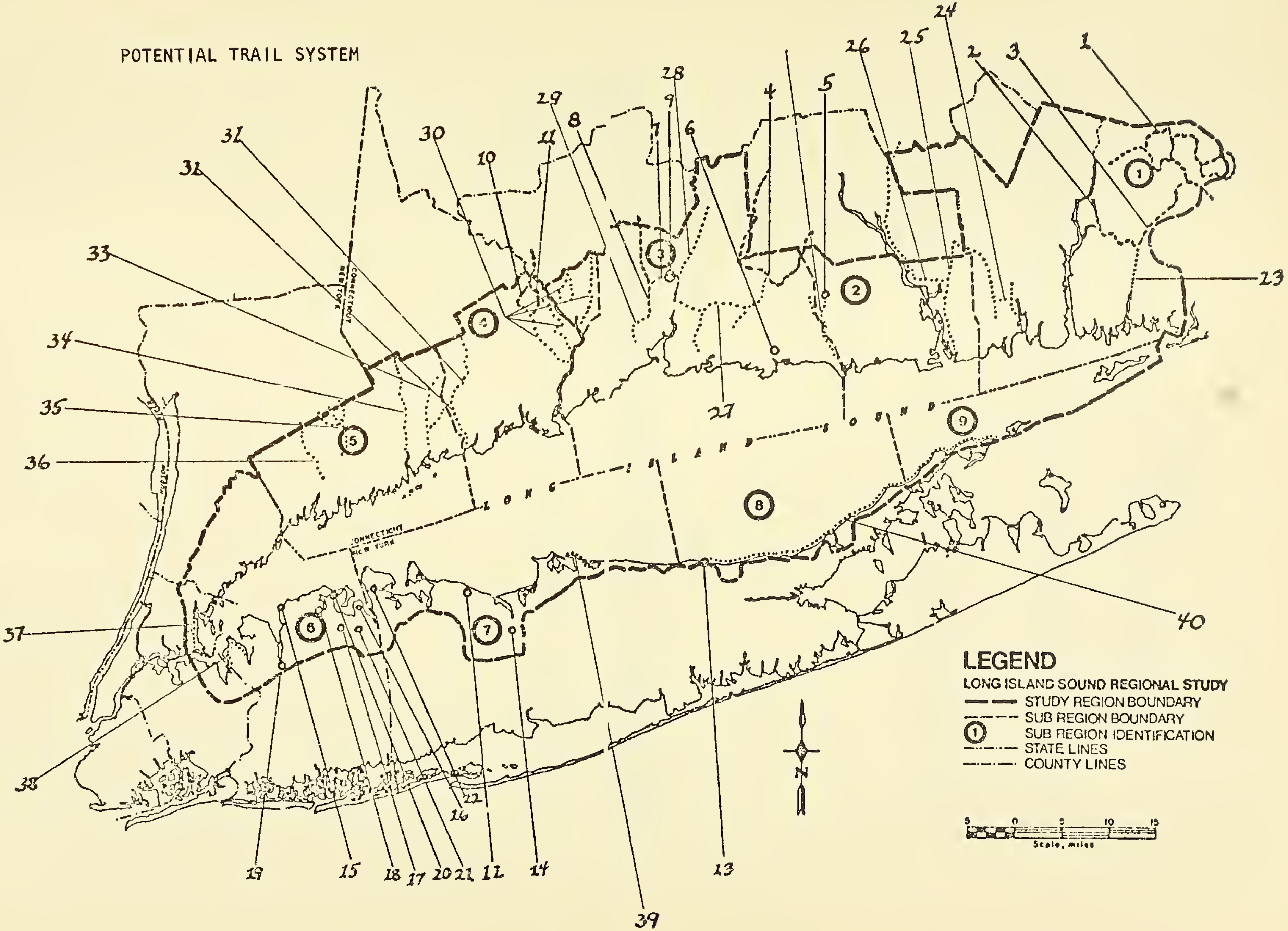
POTENTIAL TRAIL SYSTEM



APPENDIX E

EVALUATION MATRIX OF RECREATION ALTERNATIVES

The 54 criteria listed in the left column of the evaluation matrix on the following pages are a synthesis of guidance obtained from many sources. Most notable among them are:

- The Principles and Standards of the U.S. Water Resources Council.
- Various guidelines for the preparation of environmental impact statements required under the National Environmental Policy Act of 1969.
- The Coastal Zone Management Act of 1972.
- The Long Island Sound Plan of Study.
- Guidance from the staff of the New England River Basins Commission.
- Concepts developed by study participants.

Unless otherwise indicated, entries in the evaluation matrix reflect judgements as the most likely, overall, long-term and widespread effects of implementing a specified measure (a column) on a specified criterion (a row).

A list of footnotes on page E-4 further defines certain criteria and their relationships to recreation.

EVALUATION MATRIX
OF
RECREATION ALTERNATIVES

Evaluation Key:

Most entries in the Matrix are portrayed by the following symbols:

++ Outstandingly Beneficial
+ Significantly Beneficial
o Not applicable or benefits and adversities are generally minor
- Significantly Adverse
= Severely Adverse

The following abreviations are used for some entries:

MEB - Medium Benefits - Costs
PUB - Public Benefits - Costs
PR - Private Benefits - Costs
F - Federal Agencies
S - State Agencies
L - Local Agencies

The summary rating entries are:

GOOD - Beneficial entries exceed adverse entries
FAIR - Beneficial and adverse entries balance
POOR - Adverse entries exceed beneficial entries

					SUMMARY EVALUATION OF																
					ALTERNATIVE BEACH SWIMMING MEASURES										ALTERNATIVE BOATING MEASURES						
						Relocation from flood plain															
				Footnotes	Acquisition of vacant land	Prior to natural disaster	Following natural disaster	Development of artificial islands	Open beaches to all during week	Alternation of work week	Improve auto access	Coordinate public transit schedules	Improvements to existing beaches	Expand safety coverage	Municipal marina development as described	Boat access in conjunction with relocation from flood plain for beaches	Multiple use for boat access	Alternation of work week	Clear protected water for boating traffic	Maximize activity day use of boats	Property tax allowance to marinas
EVALUATION CRITERIA	ENVIRONMENTAL CRITERIA	env. quality	Natural Beauty		+	+	+	o	o	o	-	o	-	-	+	+	o	o	+	o	o
			Land: Erosion and Sediment		o	o	o	-	o	o	o	o	o	-	o	+	o	o	o	o	o
			Water: Water Quality		o	+	+	-	o	o	o	o	o	-	-	o	-	o	+	-	o
			Air: Air Quality		-	+	+	-	-	+	-	o	-	o	-	o	-	+	o	-	o
		ecological systems	Terrestrial: Plants	1	o	+	+	+	o	o	o	o	o	o	o	+	o	o	o	o	o
			Terrestrial: Animals	1	o	+	+	+	o	o	o	o	o	o	o	+	o	o	o	o	o
			Aquatic: Plants	1	o	o	o	-	o	o	o	o	o	-	o	o	o	o	o	o	o
			Aquatic: Animals: Anadromous	1	o	o	o	-	o	o	o	o	o	-	o	o	o	o	o	o	o
			Aquatic: Animals: Resident: Cold Water	1	o	o	o	-	o	o	o	o	o	o	o	o	o	o	o	o	o
			Aquatic: Animals: Resident: Warm Water	1	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
		scarce res.	Archeological - Historical	2	o	o	o	o	o	+	o	+	+	o	o	o	o	+	o	o	o
			Biological	2	+	+	+	o	+	+	+	+	+	o	+	+	+	+	+	+	+
			Geological	2	+	+	+	o	+	+	o	+	+	o	o	o	o	+	o	o	o
			Irreversible Committments	3	+	+	+	=	++	++	=	++	++	-	o	+	o	++	++	++	+
			Summary Environmental Rating		F	G	G	P	F	G	P	F	F	P	F	G	F	G	G	G	F
	ECONOMIC CRITERIA		Annual Benefits	4	+	+		+		+	++	+	+	++	+	+	++	+	o	+	+
			External Benefits		++	+	+	++	+	++	++	++	+	+	++	++	++	++	++	++	++
		costs	Present Worth		-	-	-	=	o	-	=	o	+	=	=	=	+	-	o	o	o
			Annual Costs	4	-	-	-	-	-	-	-	-	-	-	-	0	-	-	o	o	o
			External Costs		-	=	-	=	0	=	0	0	0	=	0	=	0	=	=	0	0
			B/C Ratio	5	++	++	++	+	+	0	+	++	0	0	+	+	++	0	+	++	+
		other	Jobs	6	+	+	+	+	0	0	+	0	+	+	+	0	+	0	0	0	0
			Population	7	+	+	+	+	-	-	++	++	0	++	++	+	0	-	0	0	0
			Economic Base and Stability		+	+	+	0	+	-	0	+	+	+	+	0	0	-	0	0	+
			Environmental Desireability		+	+	+	-	+	+	0	+	+	-	+	+	0	+	+	-	0
			Summary Economic Rating		G	G	G	F	F	F	F	F	G	F	G	F	G	F	F	G	F
	SOCIAL CRITERIA		Primary Incidence of Benefits		PUB	PUB	PUB	PUB	PUB	PUB	PUB	PUB	PUB	PUB	PUB	PUB	PUB	PUB	PUB	PR	PR
			Primary Incidence of Costs		PUB	PUB	PUB	PUB	PUB	PR	S	PUB	PUB	PUB	PUB	PUB	PR	PR	OC	PR	PR
			Life - Health and Safety		+	+	+	+	+	+	++	+	++	+	++	+	0	+	+	+	0
			Educational - Cultural - Recreational		++	++	++	++	+	++	++	++	++	++	++	++	++	++	++	++	++
			Energy Conservation		+	++	++	+	-	+	-	++	+	+	+	0	+	+	0	0	0
		ability to meet other needs	Land Use		++	++	++	+	+	+	+	+	+	+	+	++	+	+	0	0	0
			Water Quality		-	0	0	-	0	0	0	0	0	0	0	0	0	0	+	-	0
			Water Supply		0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0
			Shoreline Appearance and Design		++	++	++	+	++	0	0	0	++	-	+	++	0	0	+	0	0
			Erosion and Sedimentation		0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	0	0
			Flood Damage Reduction		++	++	++	-	0	0	0	0	++	-	0	++	0	0	0	0	0
			Recreation		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
			Fish and Wildlife		+	+	++	+	++	++	+	+	+	0	++	++	++	++	+	++	++
			Transportation		+	0	+	0	+	++	++	++	+	+	+	+	+	++	0	0	0
			Minerals		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Power		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Legal - Judicial Involvement		++	-	-	-	+	0	0	0	0	0	0	-	-	0	0	0	0
		inst.	Agencies Primarily Responsible		SL	S	S	S	L	PR	S	PR	S	FSL	SL	S	PR	PR	FS	PR	L
			Ease of Administering		-	=	=	0	=	=	0	=	+	+	0	0	0	=	+	-	0
			Preferability of Non-Federal Action	8	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0
		other pol.	Ease of Creating Institution		0	=	=	0	=	0	0	0	0	0	0	0	0	0	0	0	=
			Ease of Passing Law		+	=	=	0	=	0	0	0	0	0	0	0	-	0	0	0	=
			Community Continuity		+	+	+	+	+	++	-	++	+	+	++	+	+	++	0	0	0
			Environmental Attractiveness		+	++	++	+	+	+	-	++	+	0	+	+	+	+	+	-	0
			Years to Implement (& Soon, - many)		5	5	5	10	5	5	5	5	5	5	5	5	5	5	5	5	5
			Summary Social Rating		G	G	G	F	G	G	G	G	G	F	G	G	G	G	G	G	G
			Applicability to General Objectives		ALL	ALL	ALL	ED	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL

EVALUATION MATRIX
OF
RECREATION ALTERNATIVES

Evaluation Key:

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L - Local Agencies

The summary rating entires are:

GOOD - Beneficial entries exceed adverse entries
FAIR - Beneficial and adverse entries balance
POOR - Adverse entries exceed beneficial entries

				SUMMARY EVALUATION OF															
				ALTERNATIVE CAMPING MEASURES						ALTERNATIVE PICNICKING MEASURES					ALTERNATIVE OPEN SPACE MEASURES				
			Footnotes	Public acquisition/develoment	Multiple use of watershed lands	Multiple use of forest lands	Development of existing parks	Tax allowance for use of agricultural land	Property tax allowance to private entrepreneur	Public acquisiton/development	Picnic facility in conjunction with relocation from flood plain for beaches	Multiple use of watershed lands	Open parks to all during week	Development of existing parks	Public acquisition/development	Regulation of land use	Leisure Transportation	Expansion and diversification of urban recreation programs	Right of first refusal
EVALUATION CRITERIA / ENVIRONMENTAL CRITERIA	env. quality	Natural Beauty		o	o	o	o	-	o	+	+	+	o	o	+	+	0	0	+
		Land: Erosion and Sediment		o	o	o	o	o	o	o	+	o	o	o	0	+	0	0	0
		Water: Water Quality		o	o	o	o	o	o	o	o	o	o	o	0	0	0	0	0
		Air: Air Quality		o	o	o	o	o	o	o	o	o	o	o	0	0	0	0	0
	ecological systems	Terrestrial: Plants	1	o	o	o	o	o	o	o	+	o	o	o	0	0	0	0	0
		Terrestrial: Animals	1	o	o	o	o	o	o	o	+	o	o	o	0	0	0	0	0
		Aquatic: Plants	1	o	o	o	o	o	o	o	o	o	o	o	0	0	0	0	0
		Aquatic: Animals: Anadromous	1	o	o	o	o	o	o	o	o	o	o	o	0	0	0	0	0
		Aquatic: Animals: Resident: Cold Water	1	o	o	o	o	o	o	o	o	o	o	o	0	0	0	0	0
		Aquatic: Animals: Resident: Warm Water	1	o	o	o	o	o	o	o	o	o	o	o	0	0	0	0	0
	scarce res.	Archeological - Historical	2	+	o	o	o	o	o	+	+	+	+	+	+	+	+	+	+
		Biological	2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
		Geological	2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
		Irreversible Commitments	3	++	-	-	-	+	+	++	++	++	++	++	++	++	++	++	++
		Summary Environmental Rating		G	F	F	F	F	F	G	G	G	G	G	G	G	G	G	G
EVALUATION CRITERIA / ECONOMIC CRITERIA		Annual Benefits	4	+	+	+	+	+	+	++	+	+	+	+	++	+	++	++	+
		External Benefits		++	++	++	++	++	++	+	++	++	++	++	++	0	++	0	+
	costs	Present Worth		-	o	o	o	o	o	=	=	o	o	+	=	0	=	-	0
		Annual Costs	4	o	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
		External Costs		0	0	0	0	0	0	0	=	-	0	0	0	0	0	0	0
		B/C Ratio	5	+	+	+	+	+	+	++	+	+	+	+	+	+	+	++	+
	other	Jobs	6	+	+	+	+	+	+	0	0	+	0	0	0	0	0	0	0
		Population	7	0	+	0	0	-	-	0	0	0	0	0	0	0	0	0	0
		Economic Base and Stability		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Environmental Desirability		+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0
		Summary Economic Rating		G	G	G	G	F	F	G	F	G	F	G	G	F	G	F	G
EVALUATION CRITERIA / SOCIAL CRITERIA		Primary Incidence of Benefits		PU	OC	PUB	PUB	PUB	OC	PUB	PUB	PUB	PU	PU	PUB	PUB	PUB	PUB	PUB
		Primary Incidence of Costs		PU	PR	PUB	PUB	PUB	PUB	PUB	PUB	PUB	PU	PU	PUB	PUB	PUB	PUB	PUB
		Life - Health and Safety		+	+	+	+	+	+	+	+	+	+	+	++	0	+	++	0
		Education - Cultural - Recreational		++	++	++	++	++	++	++	++	++	++	++	++	+	++	++	+
		Energy Conservation		0	0	0	0	-	-	0	0	0	+	+	0	0	++	0	0
	ability to meet other needs	Land Use		+	+	+	+	0	+	+	++	+	0	0	++	++	0	0	++
		Water Quality		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Water Supply		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Shoreline Appearance and Design		0	0	0	0	0	0	+	++	0	0	0	++	+	0	0	+
		Erosion and Sedimentation		0	0	0	0	0	0	0	0	0	0	0	0	+	0	0	0
		Flood Damage Reduction		0	0	0	0	0	0	0	++	0	0	0	0	++	0	0	0
		Recreation		++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
		Fish and Wildlife		+	+	+	+	0	0	0	++	0	+	+	0	0	0	0	0
		Transportation		0	0	0	0	0	0	0	0	0	+	+	0	0	++	0	0
		Minerals		0	0	0	0	0	0 -	0	0	0	0	0	0	++	0	0	+
		Power		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	pol. inst.	Legal - Judicial Involvement		0	0	0	0	=	=	0	-	-	0	0	0	=	0	0	-
		Agencies Primarily Responsible		S	S	S	S	L	L	LS	LS	PR	L	SL	SL	SL	PR	L	SL
		Ease of Administering		-	=	-	-	-	-	-	=	-	-	++	-	=	0	0	-
		Preferability of Non-Federal Action	8	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0
		Ease of Creating Institution		0	-	0	0	-	-	0	0	0	0	0	0	=	0	0	-
		Ease of Passing Law		0	-	0	0	-	-	0	=	0	0	0	0	=	0	0	-
	other	Community Continuity		+	0	0	0	0	0	+	+	+	0	+	+	++	+	++	+
		Environmental Attractiveness		+	+	+	+	+	+	+	++	+	0	0	++	++	+	0	0
		Years to Implement (& Soon, - many)		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		Summary Social Rating		G	F	F	F	F	F	G	G	G	G	G	G	F	G	G	F
		Applicability to General Objectives		ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL

APPENDIX E

EVALUATION MATRIX OF RECREATION ALTERNATIVES

FOOTNOTES

1. Recreation development can be compatible with wetland preservation when public access is limited and when activities are restricted to passive forms such as walking, bird watching, and nature study. Where no construction or filling is needed, canoeing and non-power boating are also possible.

   Hiking and nature study are also compatible recreation activities on watershed lands where water is not treated before distribution. Where water is treated, camping, picnicking, boating, and swimming can be supported.

2. Scarce resource benefits are enhanced by providing access to them via recreation proposals.

3. Beneficial effects on this row are those which result from actions that minimize or avoid irreversible or irretrievable effects and therefore preserve freedom of choice to future recreation users. Adverse effects result from failure to take such actions.

4. Quantified benefits and costs are summarized by site specific proposal, not by activity.

5. ++ is high

6. ++ is more jobs

7. ++ is concentrated

8. Not applicable since no Federal action is proposed.

COORDINATING GROUP
LONG ISLAND SOUND REGIONAL STUDY
As of the date of this report

New England River Basins Commission	*R. Frank Gregg
State of Connecticut	Richard Dowd
Conn. Coastal Zone Management Committee	Senator George L. Gunther
Connecticut Department of Finance and Control	Horace Brown
State of New York	John A. Finck
Interstate Sanitation Commission	Thomas R. Glenn
Tri-State Regional Planning Commission	Richard DeTurk
Atomic Energy Commission	Walter Belter
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Nassau-Suffolk Regional Planning Board	Lee E. Koppelman
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*Chairperson

Primary responsibility for these planning reports rests with the chair agency indicated above. The other agencies and individuals listed participated either in an active, a review, or an advisory role, but their listing here does not necessarily imply an endorsement of the report in whole or in part.